

1875.

# SUPPLEMENT.

## The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

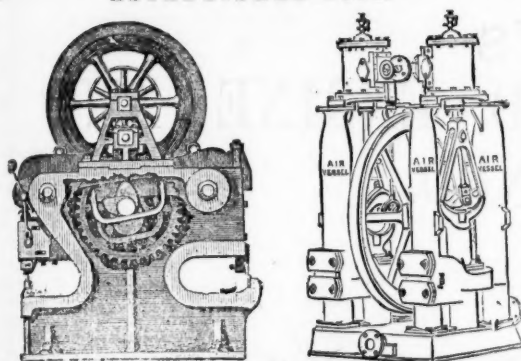
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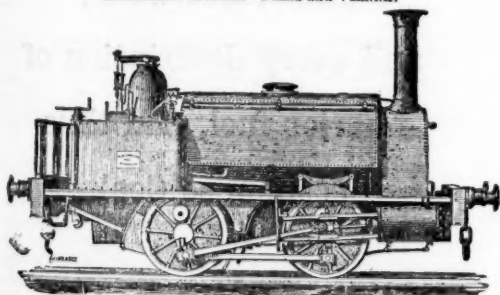
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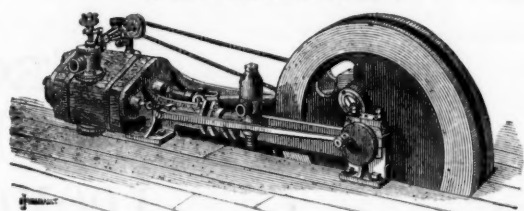
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ALL PUMPING PURPOSES.

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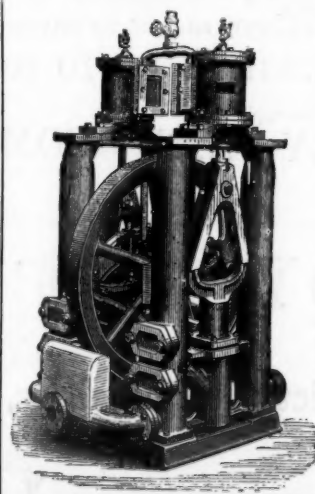
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Samples and prices on application at the Works; or of

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# THE "KAINOTOMON" ROCK DRILL,

The SIMPLEST, CHEAPEST, and BEST Machine in the World for  
SINKING, MINING, and QUARR YING,



It has been selected by the Admiralty for their works, and is extensively used at the principal Mines, Collieries, and Quarries of Great Britain, and the Continent of Europe.

"To this invention, which appears to possess several advantages over the machines previously exhibited at Falmouth, the Judges are unanimous in awarding a first-class silver medal" (the highest award).—*Report of the Judges at the Royal Cornwall Polytechnic Society's Exhibition, 1873.*

"The boring machine works splendidly."—W. TORRANCE: *Mid-Caldor.*

"For simplicity, compactness, and performance of work, your drill excels all others."—JOHN MAIN: *Crossfield Ironworks.*

"Under the most difficult circumstances, they give every satisfaction."—G. GREY: *Montreal Iron Mines, Cumberland.*

"The simplest and best boring machine."—Capt. WASLEY's letter to the *Mining Journal*, Oct. 18, 1873.

"It gives every satisfaction."—W. E. WALKER: *Lord Leconfield's Iron Mines.*

"The rock-drill I bought of you seven months ago has given me entire satisfaction, and I am convinced that the 'Kainotomon' is the best rock-drill in the market."—P. MCGINNIS: *Strabane.*

"I am quite satisfied with the working of it. For sinking pits it is a first-rate invention; I can do as much boring with it myself as six men can do by hand."—S. JENKINS: *Abertillery.*



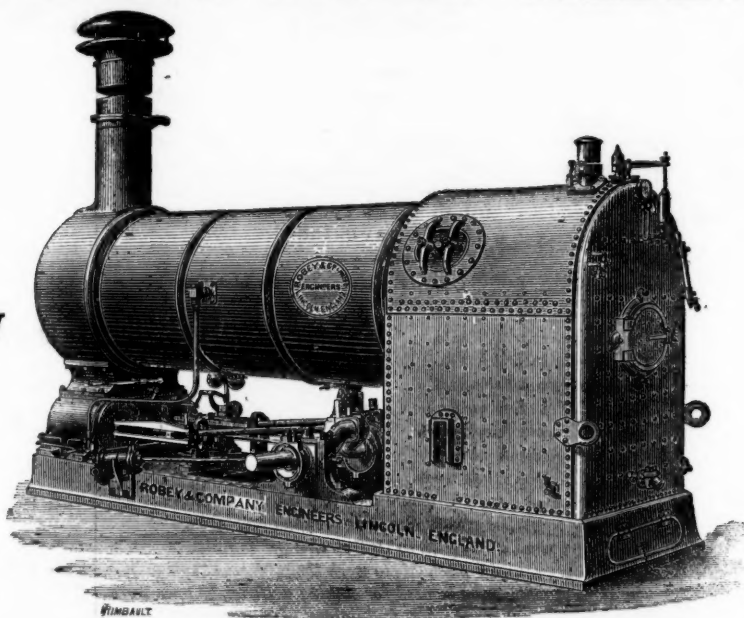
The advantages over other Rock-boring Machines claimed for the "Kainotomon" are—

- 1.—It is much shorter.
- 2.—It is much lighter, and more readily removed from place to place.
- 3.—It requires the turning of ONLY ONE, instead of a number, of set screws, to fix it in position at any angle.
- 4.—It may be fed 3 inches out of stroke, without stopping the working of the drill, an invaluable advantage.
- 5.—It is not liable to derangement.
- 6.—It has not one-third the number of parts in its construction.
- 7.—All stuffing-boxes and parts requiring adjustment are dispensed with.
- 8.—It is so simple in its construction that any ordinary labourer or miner can drive it, simply having to turn on the motive power and feed the drill.
- 9.—The rotation is compulsory, and regular.
- 10.—40 lbs. pressure only is required to work it.
- 11.—A saving of over 50 per cent. in iron and flexible piping.

"THE ECONOMIC" COAL-CUTTERS, AIR COMPRESSORS, BOILERS, &c.

THOS. A. WARRINGTON, 30, KING STREET, CHEAPSIDE, LONDON, E.C.

## ROBEY AND COMPANY'S NEW DESIGN OF HORIZONTAL FIXED ENGINE AND LOCOMOTIVE BOILER COMBINED.



The Cost of all expensive  
Brick Buildings and Chimney  
is saved by this Engine.

The Boiler is specially  
arranged to burn saw-dust  
and refuse wood,  
and every description of  
inferior fuel, and thus  
economise Coal.

Some of the advantages of the New Patent Engine are as follows:

- Small first cost.
- Saving of time and expense in erecting.
- Ease, safety, and economy in working.
- Great saving in fuel.

This New Patent Engine is free from all the objections that can be urged against using the old style of Semi-Portable Engine for permanent work, because it possesses the rigidity and durability of the Horizontal Engine, and at the same time retains the advantages of the Semi-Portable, in saving time and expense in fixing.

This New Engine is admirably adapted for driving Flour Mills, Saw Mills, Brick Machines, Pumps, Ore Crushers, Stone Breakers, and all descriptions of Fixed Machinery.

ENGINES UP TO 200 EFFECTIVE HORSE-POWER ALWAYS IN PROGRESS.

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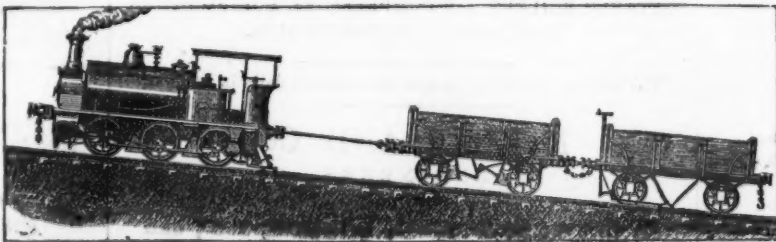
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No alteration required in the ordinary Section of  
Rails, and no addition to the Permanent Way, such  
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Also, the PATENT GRIPPING STRUTT and  
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classes of Railway Carriages or Wagons.

The Company is also prepared to negotiate for the CONSTRUCTION of NEW LINES of RAILWAY, both at Home and Abroad, in accordance with the NEW SYSTEM, which will EFFECT LARGE SAVINGS IN LENGTH, CONSTRUCTION, and subsequent repairs; and is also prepared to negotiate for  
EXCAVATION WORK of every description.



## Original Correspondence.

## COAL-CUTTING MACHINERY.

SIR.—Referring to the correspondence in the Journal lately on the above subject, I beg leave to lay before your readers an account of a visit I paid last week to Polton Colliery, near Edinburgh, to see a coal-cutting machine that it is now at work there. It is altogether of a novel construction. The machine consists of a frame, which is carried up between two end frames by means of studs or journals keyed to blocks which move up or down in slides formed in the centre of each of the end frames; thus, the whole machine, while held firmly between the end frames, can be raised or depressed, or tilted to any angle that may be required. The means employed for this purpose are two powerful screws, passed through the blocks fitted in the slides, and acting as a nut. Other two screws are employed in almost the same manner to cant or angle the machine to suit the dip or rise of the seam the machine is engaged in cutting. The end frames are mounted on wheels, which run on rails. On the frame are placed two cylinders 6 in. in diameter and 10 in. stroke, which drive a spur-wheel, which again gives motion to a revolving wheel or disc, and on both sides of this disc, at regular intervals, are placed loose or revolving cutters of about 5 in. in diameter, pointed as picked points. Thus, when the disc revolves the cutting wheels, being loose on keys fastened to the disc, are revolving at ten times the speed of the disc. The machine propels itself by a chain, which is fast at one end, and works upon a small barrel. The machine, when I saw it, was at work in a 3-ft. coal seam, cutting in an underclay of a tough nature, and doing its work exceedingly well, the machine being placed at the angle of the seam, which was 1 in 8. It cut 3 ft. deep and 1 ft. forward per minute, being 20 yards per hour. I also saw it tried in the coal, which it cut very much easier than the clay. The peculiarity of the machine is its cutting-wheels, which, being loose and revolving, thereby lessen the friction and the screws with which the machine can be set to any angle. So far as I have seen, it is the best coal-cutting machine yet at work, although it bears evidence of being got up hurriedly, but any new machines will, no doubt, be better fitted. The machine is driven by compressed air, and the average pressure necessary is 30 lbs., which is supplied by an air compressor on the surface. There is a peculiarity in this compressor that I have not observed in any other—it is not jacketed, nor is there any water surrounding the air cylinder; instead of this there is a simple self-acting water jet, which at the same time cools the air and cylinder and lubricates the piston. The air compressor is driven by the pumping gear of the winding-engine, and the whole cost of the machine, compressor, and pipes will not exceed 300l. This machine, it is stated, can also be driven by an endless rope or chain, instead of compressed air. The makers are Messrs. J. Meiklejohn and Son, Westfield Ironworks, Dalkeith, N.B. Oct. 25. COALMASTER.

## THE CHAPEL HOUSE COLLIERY.

TO THE CHAIRMAN OF THE CHAPEL HOUSE COLLIERY COMPANY (LIMITED).

SIR.—I yesterday visited the works of the company, and here propose to give a short account of what I saw, with a view to showing how far the new works have progressed since we met the shareholders at the colliery in June last. It will, doubtless, be remembered that on that occasion the new 16-ft. pit was sunk to a depth of 100 yards, and the 15-ft. pit was 50 yards deep; the new engines were on the ground, the brickwork of the engine and boiler house was just appearing above the level of the ground, and brickmaking had been commenced. Since that date, however, such progress has been made that the place hardly looks the same. The new 16-ft. pit, which was only commenced in January, is now down 193 yards, and is lined with 14-in. brickwork. It has so far been sunk quicker than any pit of a like size in the same district, and I have reason to believe the rate of progression will compare favourably with that of any sinking in the kingdom. The winding is at present effected with an old engine, with cylinders of 20-in. diameter, but which will in time be replaced by a large and powerful winding-engine. The new engine-house walls are now finished, and the roof is being put on; their size and strength, as well as that of all the other work being done, may be imagined when I mention that the base upon which the engines will rest must have consumed at least 120,000 to 200,000 bricks, and each of the trusses upon which the roof will be built weighs about 4 tons.

The new winding-engine has two cylinders, each of which is 36 in. in diameter, with Cornish valves, and all the latest improvements. These were purchased at a bargain for 1610l., and the connections and cost of fittings will amount to about 800l. more. This engine will be put in its place as soon as the house is ready to receive it, which will be in about a fortnight, and the head gear will be erected over the 15-ft. pit immediately afterwards. The head gear, which is now completed, and can be erected at any time in a week, will stand 60 ft. high, and weighs over 20 tons. Three new double-flue Cornish boilers, 20 ft. long and 7 ft. diameter, have been purchased at a cost of 325l. each, and are now in their places. Three more will yet have to be purchased. The chimney stack is a most massive affair, being 12 ft. square at the base, and over 48 yards high, the lower portion having an inner case of fire-brick. It is expected that this engine will be erected and at work by the end of the present year, when the sinking of the 15-ft. pit, which is now down 50 yards, will be re-commenced, and, it is anticipated, completed within a few months of the other. These two new pits will be sunk to a depth of 415 yards, and the seams of coal which are being intersected are as follows:—

1.—The 4 ft. coal.....	3 ft. 2 in. thick, now being worked at a depth of 50 yards.	130 "
2.—The Thick or 6 ft. 5 "	" " " " " "	" "
These have been passed through.		
3.—Coal and base.....	5 ft. 11 in. will be found at a probable depth of 289 yards.	" "
4.—Dam.....	" " " " " "	300 "
5.—Coal.....	" " " " " "	311 "
6.—Fard Mine.....	" " " " " "	350 "
7.—Coal, good.....	" " " " " "	" "
8.—Earth.....	" " " " " "	" "
9.—Coal Yard.....	" " " " " "	361 "
10.—Coal.....	" " " " " "	" "
11.—Earth.....	" " " " " "	393 "
12.—Coal.....	" " " " " "	" "
13.—Park.....	" " " " " "	415 "

The new pits will be continued without delay to the Park Mine, at a depth of 415 yards. This coal realises about 1s. 6d. per ton more than the Chapel House Colliery Company now obtains for its coal.

Runby Park..... 3 ft. will be found at a probable depth of — yards.

Blagrove or Arley Mine 4 ft. " " " " " "

These are equal to the Park Mine in quality.

There yet remains another series of coal seams which are of good quality, and which the Arley Mine being reached, it would not be difficult to sink to. And now a few words with regard to the prospects of the company. You can see by the accounts what are the present raisings and profits of the company. The new plant is being erected with a view to raising 1000 tons per day; and supposing at the price of coal remains at its present low rate, it will, nevertheless, be seen that the profits must be very large, and the shares most valuable. But there is yet one feature in the prospects of the company which cannot be too highly valued. The three lowest seams produce the best house coal, for which there is a very large demand. The manager informs me he could sell almost any quantity of it at an advance of 1s. to 1s. 6d. per ton upon the prices we are now obtaining. This difference in price is alone equal to that calculated upon as profit at many collieries, whereas the many advantages possessed by the Chapel House Colliery make it only a good example of already most satisfactory gain. Under these circumstances, and with the probability of a rise rather than a fall in the price of coal, it is easy to calculate what may be the prospects of dividends for the future.

In fact, presuming that no advance whatever should take place, the lowest estimate I can possibly make of the probable profits is 1000l. per annum. The higher price which can be obtained for the coal from the lower measures, as mentioned above, would add to the profits at least 10,000l. more. It will thus be seen that the company under these circumstances would be able to pay dividends of from 25 per cent., besides paying off the debentures to the extent of 1000l. annually. When these and the mortgage become extin-

guished the dividends could, of course, be increased by this amount. Any advance, however, in the price of coal would make a further most appreciable increase in the profits of the company.

I have during the last two years visited a large number of collieries, but I have seen none to equal the Chapel House. Limiting, however, my anticipations of the future to the very lowest, I can see that if the present plan with regard to the increase of the plant be carried out the shareholders will have reason to congratulate themselves as being partners in one of the most prosperous of companies.—London, Oct. 27. THOS. THOMPSON, jun., Director.

## COAL MINING IN SCOTLAND.

SIR.—Will you allow me to make a few remarks in reference to the letter headed "Coal Mining" in last week's Journal? In regard to the plan proposed by your correspondent of driving ends 7 ft. wide, surely he cannot be aware that the coal from such narrow places would be nearly all dress; and not only that, but the miner would be required to be paid a-half more for working in these places than in those 4 yards wide (the usual size). The coal requires to be sheared on one side, and a shot put in on the other side of the place, in which case it is evident that a very large proportion of the coal would be turned into dross. Nor is it apparent from your correspondent's letter what great advantage is to be gained from these places. Of course, the narrower the places the better when you come to take out the stoops; but surely the advantage gained would not at all compensate for the extra prices required to be paid for driving such places. The following is, I think, a good idea for working coal by the "ranch and room" method:—Form large "ranches" 60 yards along level courses and 30 yards to the rise, the places driven through them being 12 ft. wide; as soon as three of these have been formed take out the middle one, leaving the one nearest the bottom to act as a bottom stoop, continue to form these large ranches, taking them out as you go along, and only leaving in such as are needed to support the main drawing-roads. I believe this method will be largely adopted in the future. All must agree with "An Engineer" as to the desirability of having all stoops as square as possible, and all places driven straight. VERITAS.

Glasgow, Oct. 16.

## DYNAMITE AND GUNPOWDER.

SIR.—There appears to be a disposition to cast discredit upon Cornish miners for their apathy in adopting dynamite in replacement of gunpowder, which I think is scarcely justified by the facts of the case. No one denies that dynamite is more powerful than ordinary blasting powder, such as is used in the mines of Cornwall, but there are some who still doubt both the safety and the economy of dynamite. The announcement continues to be made that not a single accident has occurred in the transport or storage of dynamite, yet the opinion very generally prevails that the fact of the manager of the Dynamite Company having been blown to atoms whilst superintending the unshipment of a cargo, to some extent, at least, impugns this statement. The assertion that I heard at one mine that as the fragments of Mr. Downie could not be found there was no evidence to show that he was killed, seems scarcely admissible, even if it be true that Mr. Downie's dissociation was as complete as stated. It is always well in business to keep to facts, and as there is plenty of room for dynamite, lithofracteur, Horsley's powder, and the various other explosives in the market, it is to be regretted that any one of them should be run down by the representatives of another.

That dynamite, lithofracteur, and explosives of that class can be made safe is very generally admitted, but there is this important difference between these explosives and gunpowder, any carelessness or inattention in the manufacture of gunpowder merely produces an article of inferior quality, and consequently of less commercial value, whilst similar carelessness or inattention in the manufacture of dynamite, lithofracteur, gun-cotton, &c., produces not a merely low-quality material, but a dangerously explosive one. There is little doubt that it is to carelessly manufactured parcels of material (and perhaps only one in a thousand parcels are carelessly made) that may be attributed the deaths of Messrs. Prentice at Stowmarket, and of Mr. Downie in Ireland, and inasmuch as such carelessness and inattention cannot be constantly guarded against, the utmost caution should be exercised in adopting the explosives which are only sometimes safe. It should also be considered that a rendering power five times greater than gunpowder is seldom required, and that in boring holes of a given depth they must be made of a certain diameter, whilst to get the best result with any explosive the diameter of the whole must be filled, so that it not unfrequently happens that the object sought is better attained with 5 in. depth of gunpowder than with 1 in. depth of dynamite, although the two represent the same power.

But after all the economy is the great question which is considered, and in this even the circular of the company itself shows that with dynamite at 2s. per lb. and blasting powder at 5d., it costs more to use dynamite than powder to do a given quantity of work under ordinary circumstances, so that unless it is with the object of driving at high speed for a special purpose I should be inclined to continue the use of gunpowder as the safest and most economic explosive for mines.—Oct. 27. CAPTAIN.

## FOREIGN MINES, AND ENGLISH CAPITAL.

SIR.—Does the employment of home capital in foreign mines pay as an investment? This question now occupies the attention of many, nor is it a question easily or satisfactorily replied to. Vendors and promoters aside, all mines would have returned some sort of dividend upon a legitimate amount of capital. The bane has been inordinate demands on the part of vendors and promoters, and the consequent undue weighting of the capital. Equally prejudicial has been the effect upon the mines themselves, as in the absence of adequate working capital development has been hindered or not undertaken, and resources have been neglected or unwrought. Need other instances be cited than the mines of Nevada and Salt Lake? Can one exception be quoted?

In Nevada there cannot be called to mind just now more than two out of the number that are at present bearing out the promises and sustaining the representations of the vendors. Even one of these did not until quite recently become a very desirable or profitable purchase under the administration of its English managers. It was driven to nearly the verge of bankruptcy, and how the company escaped the usual refuge—the Winding-up Court—is unaccountable to those who knew and understood the character of the executive placed at its head. It is presumable that the magnitude of the price paid for the property, and the means that had been recklessly squandered in unprofitable working and useless experimentalising, together with the great faith in the value and permanence of the mines, were the inspiring reasons that prompted a further and further disbursement with more golden ducats. It is a fact scarcely flattering to English mine managers that until this company determined to entrust the management to an American—and did do it—no certain or encouraging returns had ever been received from the vast sums expended. Since then success has followed success, until now its English owners can at least console themselves with the sweet satisfaction derived from the consciousness of owning a valuable property free from indebtedness of every kind, established upon a paying basis, with a radiant future before it. The other Nevada mine has also had its varied difficulties—legal, managerial, metallurgical. Legal complications had at one time nearly sealed its fate. Like its fellow, its earlier career had been scotched by slender means, for which the initiators were wholly and inexcusably responsible. More than one issue of additional capital became urgent, otherwise the existence of the company had soon been a "thing of the past." Difficulty after difficulty disappeared, discoveries were made, each exceeding the other in value and extent, until in June last, after there had been returned in dividends 50 per cent. of the paid-up capital, the ore reserves were estimated at 100,000 tons, ensuring profits for some time to come.

Salt Lake compares unfavourably with Nevada; this is not because Utah has placed fewer mines upon the London market, nor that the mines themselves have proved less productive. Utah has a serious gravamen against avaricious promoters, whose greed will

have checked for many years the legitimate development of its teeming mineral resources, probably equalling any other state on the Pacific Coast. Malignant Emma has paid 182,000l. in dividends; and had the company been capitalised at any moderately fair amount, leaving a good margin of profit for the initiators, Emma would yet have stood well in our market. The decadence of Emma was followed by the collapse of Flagstaff. Did ever a valuable mine suffer so greatly at the hands of vicarious progenitors? But these venalities paled away before misfeasance and mismanagement. Even so, Flagstaff paid in dividends 123,000l., and those only who had it in hand from 1873 know the profit yielded since that period. Rumour asserts the amount exceeds considerably that divided among the shareholders! Last Chance, floated upon the success of Flagstaff, with less pretensions as to capital and dividends, with drawbacks peculiarly its own, returned to its shareholders 11,000l. Tacoma has been thus far a blank; the latest advices speak encouragingly of its prospects; it may yet remove its unenviable reputation, and fulfil the fair promises foreshadowed at its inception.

California has been a more successful field for English investors. Here are the several hydraulic gold mines—all are pronounced successes; most, in face of exceptional outlay, properly chargeable to capital, have paid at least fairly satisfactory dividends. Revenue has in most cases been made to meet expenditure incurred to provide permanent works; yet Sweetland Creek has already repaid in dividends an amount approximating its entire subscribed capital. Birdseye Creek has paid its shareholders 30 per cent. of its subscribed capital. Cedar Creek has heavy and costly works in hand, which cannot be completed before the commencement of next year's water season; but the prospects of a remunerative career are regarded as favourable. Blue Tent, admittedly the richest and by far the most extensive property held by any English company, has just successfully completed an aqueduct of more than 30 miles in length. This will supply abundant water, some of which it is proposed to sell to neighbouring companies. By this an independent and handsome revenue will be commanded. The returns of gold, judging by what have been previously returned, seem more than likely to quickly place Blue Tent at the head of the hydraulic gold mines of California. Its quartz mines, too, have not been altogether unsuccessful. Sierra Buttes has paid in dividends 1l. 12s. per 2l. share, and its outlook indicates a career of further prosperity. London and California, however, whatever its future, is thus far an unfortunate commentary upon the favourable opinions expressed by Messrs. Janin and Ashburner. Independence also, up to the present time, has negated the anticipations of its introducers, but the latest information would seem to point to the achievement of success.

What of Spain? As a mining centre for the profitable employment of English capital Spain probably stands pre-eminent. Why? Not because its mines are richer, more productive, less expensively worked, or the produce more valuable; the one simple reason is that mostly their introduction was unattended by the adventitious and depleting encumbrance of promoters. Vendors have been more directly interested in the success of the mines than in the absorption of capital. Incipient dividends have not sapped away matured vitality. Hence Linares, after having been worked for 20 years and more, is to-day a valuable property; it has quintupled its capital in the dividends returned to its fortunate owners. Fortuna, too, has paid in dividends 125,000l., upon a capital of 50,000l.; and Alamillo, started only a very few years since, has already yielded more than 50 per cent. of its subscribed capital. Each one of these stand out as signal protests against the fatal mistake of capitalising mines at immoderate amounts. Excessive capital now portends imminent failure, as it is usually measured by the exacting demands of vendors.

Brazil has its St. John del Rey, a marvellous success, destined apparently to become even yet a greater store-house of wealth. Brazil, however, has been made the undeserved victim of financial greed; from this it at present suffers, and other important discoveries may have to be made to re-direct attention to the Brazils. With the exception of Don Pedro, which has paid 1l. per (16s.) share, the whole of the remaining companies have passed away.

Foreign mining, reviewed by the phases of the past few years, has a powerful claim upon investors, as when founded upon a legitimate basis the results realised favourably contrast with any other description of investment. In many instances, not here referred to, enormous dividends have been and are being received from the judicious employment of capital, and guided by experience those who may in future complain of unprofitable outlay will have themselves only to blame. Well-selected, economically and honestly-worked foreign mines, with moderate capital, are more highly remunerative than any other class of investment offering equal security.

Stock Exchange, Oct. 27. MEMBER OF THE STOCK EXCHANGE.

## RICHMOND CONSOLIDATED MINING COMPANY.

SIR.—With reference to a letter from "A Member of the Stock Exchange," in last week's Journal, allow me to state that the returns from the Richmond Mine for eight weeks last year from Sept. 1 averaged 35,250 per week. The returns for the eight weeks of the current half-year from Sept. 1 average 40,250 per week, thereby showing 5000 per week more for the current half-year. The cabled return for the week ending Oct. 31, 1874, was 35,000, and it was not until November that the returns improved. Whatever our disappointments may have been, let us at least have the truth. Oct. 28. RICHMOND MINE SHAREHOLDER.

## RICHMOND CONSOLIDATED MINING COMPANY.

SIR.—The average weekly cabled returns for the half-year ending Aug. 31 was 34,000—i.e., 8000l., making for the half-year a total of 208,000l. The gross revenue for the half-year ending Feb. 28 was 222,504l.; the net revenue for same period 80,309l. Calculating the expenses of the half-year ending Aug. 31 to be in the same proportion as they were for the half-year ending Feb. 28, we should have a net revenue on Aug. 31 of 75,000l. A dividend at 15s. per share would absorb 40,500l., leaving a balance of 34,500l., which I submit would more than meet any extraordinary expense beyond the calculation of an outsider. Putting the net revenue at 75,000l. is not taking credit for increased profit by the erection of the new refining works, the first set of which was started on Feb. 18, and the other two sets subsequently, so under these circumstances we may safely calculate on a 15s. dividend, and I trust that a good balance will be carried forward to the reserve fund for working expenses, and so enable us to get out of the hands of the bullion agent, and place us in the independent position of trusting simply to the net revenue for dividends, unalloyed by the capricious advances from a bullion agent, who threw us over at the eleventh hour, and did not even communicate his determination by post, but waited till the last moment, and then cabled "no dividend." SHAREHOLDER. Oct. 26.

## RICHMOND CONSOLIDATED MINING COMPANY, AND ITS "ORE RESERVES."

SIR.—Mr. F. W. Mansell, in last week's Journal, raised a vitally important question affecting the estimated value of our "ore reserves." Mr. Mansell tells us that ore deposits of this kind are richer in what he terms "massive limestone." We are also told that the nature of the formation changed in depth to quartzite. The inference from this would seem to be that the deeper our explorations the less rich and profitable the vein. May I ask, through your columns, whether elsewhere this statement of Mr. Mansell's has been proved to be correct? To me, not very *au fait* upon such points, the statement is startling. I have held my shares all the way through, believing that the vein grew richer, and, if I mistake not, this was said to be so by our Chairman at the last meeting of shareholders. Mr. Mansell has further told us that what, I think, he calls the "length of the vein" is gradually becoming shorter. Does he mean that the vein at deeper points is poorer or richer, as I have read somewhere that oftentimes as veins become consolidated the richer the ore. Should this not be the meaning, are we to look upon this feature as unsatisfactory? The formation altering in depth cannot alter the value of the reserves we were told by Prof. Price we possessed, and upon which I was led to increase my interest. I imagine we have the right to continue our excavations laterally



Personally, I am confused—what may we look for next? Certainly the shareholders require at the hands of Mr. Mansell some further explanation in regard to his extraordinary statement.

Oct. 26.

A SHAREHOLDER.

## THE RICHMOND CONSOLIDATED MINING COMPANY.

SIR,—Some two months ago you inserted a letter of mine in which I foretold that as soon as the "bears" had knocked the shares down sufficiently the old holders, who had parted with their shares when the "bulls" forced them up to 16, would come back again. The time has now arrived to purchase for those who wish to be in the dividend which will be declared next month. I was glad to hear to-day that a well-known lead smelter, who has erected the new Rozan pans at his works on the Tyne (the same that are now being worked at the Richmond Mine at Eureka), has purchased 600 Richmond shares, thus bringing his holding up to 1000 shares again; and I fancy after the next settling-day we shall see the old names on the share list. The directors have evidently continued confidence in it, as is shown by their holding, the Chairman 1200 shares, the vice-Chairman 1000 shares, and Mr. Probert 500. The dividend next month will be on the six months' working, ending Aug. 31, 1875; the gross profit will be 210,000. The working expenses will be large, owing to the new Rozan pans, and other reasons, and the net profits will be further reduced by the board having applied another 25,000 to working capital, thus taking us more and more out of the hands of our financial agent, who disappointed us in September. However, I fully expect that the balance-sheets, which are now in the hands of the accountants, will work out so as to allow a dividend of 10s. per share, or 10 per cent. on the half-year.

The working since Sept. 1 has been highly satisfactory, and the expenses moderate. Mr. Probert has been at San Francisco, but he is now returning to Eureka; and I have no doubt but that before he has been there long the Rozan pans will do their work well, and our week's yield will rise from an average of \$42,000 to \$52,000, which means a 50 per cent. dividend. I heartily thank Mr. McKenna and the "bears" for knocking the shares down. I have just got in at 74, and I hope the shares will keep down a few days longer to let my friends get in.

ONE BEHIND THE SCENES.

## GOLD IN WALES—No. VI.

SIR,—The existence of gold in the British Isles was known at a very remote period of history, and it is certain that many adventurers, in crazy craft, came to this country in search of metallic wealth. Julius Cæsar, probably, invaded these islands more for the acquisition of supposed riches than the conquest of a rude and barbarous people. The opinion is strengthened, if not confirmed, by the expression of Gaius, whilst attacking the Caledonians, "Britain produces gold, silver, and other metals, the booty of victory." A celebrated triad makes three Welsh chieftains the enviable possessors of *golden cars*, and Meyrick reasonably infers from this that gold mines were worked by the Welsh (*Cymri*) at a very early period.† The style of the golden weapons, torques, bracelets, &c., that have been found at various times is very simple, and quite unlike the style of ornamentation of the early Christian period; and it is, therefore, naturally inferred that they belonged to a time long anterior to that. It is, however, certain that the Romans actually discovered gold in Wales, and wrought it too; for, independently of the statement of Tacitus, just quoted, there are evidences, plenty, of Roman mine works where gold must have been the principal if not the sole object of exploration. One of the most remarkable is Gogofau, in Caermarthenshire.‡ This gold mine is situated on the banks of the Cothy, and forms part of the grounds of Dolau-Cothy. Here, a quartz lode has been worked "open to the day," and levels driven 170 feet through the slate. The officers of the Geological Survey discovered gold here, and a metallurgical workshop. Amongst other things a beautiful gold necklace was found, which is in the possession of Mrs. Johnes, the wife of the gentleman to whom the property belongs. Other instances might be cited in proof of the former existence of gold in tolerably large quantities in many parts of these islands.§

Strabo coincides with Tacitus, as to the precious metals, but Cæsar makes no mention of gold and silver. Cicero (B.C. 106) says—"In Britannia nihil esse audio neque auri neque argenti" || and in another epistle (ad Attic.) he says—"It was well known that not a single grain of silver could be found in the island."\*\* The statements of Cicero do not, however, tally with subsequent history, and are contradicted by Camden and other modern authorities. Probably there is not, and never was, gold and silver enough discovered in Britain to be, as Tacitus thought, "the booty of victory." Yet the comparative scarcity of precious stones at the time would tend to pre-induce a desire to possess in quantity, the next best representatives of value, the precious and the baser metals. Cimboline, prince of the Trinobantes, had a coinage of gold; this was supposed to be made of British gold obtained in Essex, but the Essex Gold Mine is exceedingly problematical.

An idea appears constantly to have prevailed that the gold of this country was by no means of insignificant quantity or value. The avarice of kings and the exigencies of State, as soon as possible, and, as a matter of course, laid claim, not only to all the gold and silver found, but to all the baser metals as well. These pretensions were, however, subsequently abandoned, and the Crown was divested of all rights in minerals, except gold and silver, these precious metals being retained, as it was said, for the purposes of coinage, and to support the dignity of the Crown.†† That great legal authority, Sir Edward Coke, laid down the law "that veins of gold and silver in the grounds of subjects belong to the king, by his prerogative, for they are royal mines."‡‡ And the justices and barons in the "great case of mines" (1568) unanimously agreed,§§ "that by the law all mines of gold and silver within the realm, whether in the lands of the Queen or her subjects, belong to the Queen by prerogative, with liberty to dig and carry it away." And so firmly was the prerogative of the Crown thus established that it was agreed that a royal mine could not be severed from the Crown, but the judges overruled this. The only doubt existing in the time of Elizabeth was whether "if gold and silver were found intermixed with the baser metals, the whole became a royal mine." Some contended that any quantity of gold or silver so found was sufficient, whilst others held the opinion that the gold and silver must exceed in value the other metals, but the judges decided that even when the gold or silver in a mine of base metals in the land of a subject was of less value than the base metal, the mere circumstance of its existence makes it a royal mine. The uncertainty of the law on this decision caused general distrust, and destroyed to a great extent this kind of enterprise, therefore in the first year of William and Mary an Act was passed (cap. 30), wherein it was declared that no mine of copper, tin, iron, or lead shall hereafter be adjudged a royal mine, although gold or silver might be extracted out of the same. This provision, also, was soon considered insufficient, and in the fifth year of William and Mary an Act was passed (cap. 6), entitled "An Act to Prevent Disputes and Controversies concerning Royal Mines," wherein it was enacted that all persons, being subjects of the Crown of England, owners of mines within the kingdom of England, dominion of Wales, or Berwick-upon-Tweed, wherein there is copper, tin, iron, or lead, may enjoy, &c., the same, notwithstanding said mines may be pretended or claimed to be royal mines. But by the second statute the Crown, or any other person claiming royal mines under the Crown, has the option of purchasing said ores before removal other than tin ore in the counties of Cornwall and Devon, upon payment of a price fixed by the said Act—Copper, 13s.; tin, 2s.;

iron, 2s.; and lead, 9s. per ton. By the 35 George III., cap. 134, the right of pre-emption which is given to the Crown, and those claiming under the Crown, so far as relates to lead, can only be claimed upon payment of 25s. per ton, instead of 9s., as previously fixed.

From this it would appear—1. That the right of pre-emption given to the Crown is limited to copper, iron, and lead, wherever found; and to tin to be found in England, other than in Cornwall and Devon, if such ores contain gold or silver.—2. That the rights of the Crown to all mines where gold and silver exist intermixed with any substance whatever other than copper, iron, lead, or tin, remain unaffected by either of the statutes of William and Mary.—3. That the rights of the subject to all mines of copper, lead, and tin, even if gold and silver be found therewith, is confirmed by the said statutes, subject only to the right of pre-emption just stated.\* But, if any other auriferous ores be discovered, it will be difficult to determine the respective rights of the Crown and the subject to such a mine, unless the "great case of mines" should be adopted in favour of the Crown. Under any circumstances there is no provision made for such a discovery. Independently of this, the law is not settled, that pure gold and silver, wherever found, are the absolute property of the Crown. It is, however, not a little remarkable that the Crown has no right of entry upon private lands to search for its ores; nor has the Crown ever exercised its right of pre-emption as regards lead ore containing silver.

But since the gold discoveries in Wales, in 1854, the practice of the Office of Woods and Forests has been nearly as follows:—1. Where the gold is found in combination with other metals, the whole of which, with the necessary easements for working, are vested in the Crown; the Crown deals with the case in the same manner as an ordinary licence to search for minerals—30l. per annum minimum rent, and 1-12th royalty on the gold.†—2. Where the gold is found in combination with the minerals specified in the Acts of William and Mary, and which are not vested in the Crown, the Crown proposes to accept a royalty in lieu of the right of pre-emption.—3. Where the gold is found in a virgin state, or secreted in rocks, and not in combination with the ores and minerals specified in those Acts, on land where the minerals are not vested in the Crown, the Crown requires the parties interested to take a licence on payment of a nominal annual rent, and a royalty upon the gold raised.

The Clogau Gold Mines are at present working under a royalty to the Crown, under the first condition. There is no mine working under the second. The Castell Carn Dochan Gold Mine, on the property of Sir Watkin W. Wynn, Bart. (under the third) is not now working. It is obvious, as a general rule, that the terms exacted by the Crown are far too burdensome to encourage persons in this kind of adventure. It is thought that if the Crown would consent to impose a small annual rental, and (say) a royalty of 5 per cent. on the net profits, it would be agreed to readily; explorations would be made to a larger extent by private individuals, and the Crown would be a gainer from lands upon which it has no right of entry to realise its own.

In England, gold has been said on very doubtful evidence to exist in quantities of commercial value in the following counties—Cornwall, Devon, Somerset, Gloucester, Worcester, Salop, Bedford, Derby, Chester, Lancashire, Westmoreland, Cumberland, Northumberland, Durham, and York. The tin streams of Cornwall have yielded a little, and very small quantities of gold have been found in North Devon, especially near North Molton.

In Scotland it has been found in the following counties—Sutherland, Aberdeen, Fife, Perth, Sterling, Linlithgow, Lanark, Dumfries, Ayr, Selkirk, and Kirkcudbright. Lanarkshire is said by Pennant to have yielded 130,000 ozs.†

In Ireland the gold bearing counties are—Londonderry, Antrim, Wicklow, Wexford, and Kildare. A nugget weighing 22 ozs. was found in Wicklow, and said to be the largest ever found in Europe.||

In Wales the known gold producing counties are—Caernarvon, Flint, Cardigan, Caermarthenshire, Pembroke, and Merioneth.

Until recently, Cardiganshire, probably, has rendered more service to the State, and profit to the explorers, by the production of gold than any other Welsh county, although Sir Hugh Middleton, while ostensibly working for silver, in the time of Charles I., and his "most loyal chemist and mineralogist, Thomas Bushell," did not leave on record all they knew of Welsh gold and its associated minerals.\*\* But within the last few years Merionethshire has taken golden honours sufficient at least to make them noteworthy. Hence an especial reference to the gold mines of that county.

There are several claimants for the honour of having been the earliest of the Welsh gold finders of later times. Mr. O'Neill, in 1836, is said (and likely enough) to have found it at Cae Mawr, and the late Mr. Jas. Harvey, afterwards, at Berthillywyd. Capt. Roberts says he discovered it before either. In 1843, Mr. Arthur Dean discovered some rich gold ore at Cwmhesian, and boldly stated in the face of national disbelief that "a complete system of auriferous veins existed through the whole of the Snowdonian, or Lower Silurian, formations of North Wales."††

Mr. Dean, and after him Mr. Clement, worked about 500 tons of the Cwmhesian minerals, and obtained at the rate of more than ½ oz. of gold to the ton. The then proprietor, Mr. Bruin, was unable to carry on the works, and the gold question lumbered until ten years afterwards, when at the Clogau Mine a pile of "poor copper ore" was found. This grass-grown refuse was carefully examined by Mr. J. C. Goodman, of Dolgelley, who discovered that it really contained less of copper than of gold. Some of the stones, weighing several pounds, had gold disseminated throughout. In one beautiful specimen, since deposited at the British Museum by Mr. Readwin, there is the mark of a boring iron which has passed through the solid gold. Some of this "poor copper ore" was put to the test, and Mr. Goodman obtained 14½ ozs. of gold from 100 lbs. weight. A stone weighing 3 cwt. was taken from the lode, stamped, and sold by Messrs. Sherwood for 5s. per pound weight.‡‡ Other persons did as much as, or more than, this. Such novel and interesting facts as these naturally gave rise to the most extravagant expectations as to the ultimate value of the discovery. Quartz lodes everywhere were indiscriminately attacked by the hammers of ardent gold seekers. The Crown got a small harvest by granting gold licenses, and a good deal of rash speculation and loss was the necessary consequence.

Much weight was attached to Sir Roderick Murchison's Australian prophecy, and that recorded opinion of his, in "Siluria," that "the most usual position of gold is in quartzose veins, stones that traverse altered palæozoic slates, frequently near their junction with eruptive rocks, whether of igneous or of aqueous origin." And it was a remarkable coincidence that the gold at Clogau was found at the junction of the Cambrian sandstones and the lingula flags of the Lower Silurian rocks near an eruptive bar of porphyritic greenstone. About this time a valuable paper (already noticed) appeared in the "Journal of the Geological Society of London," in which the geology of this problematical district is described at great length by Prof. Ramsay. Director-General of the Geological Survey of Great Britain.§§ Of course, this became an era of joint-stock speculation, and companies were formed for working Clogau, Cwmhesian, and other mines, containing, or supposed to contain, auriferous minerals.

Eventually the rich Clogau Mine became the subject of two Chancery suits, and the other mines, one after another, collapsed after ineffectual attempts to extract gold by various means of amalgamation. The vexed question again lay dormant until 1857 and 1858, when the Vigra and Clogau Mines were sold by order of the Court of Chancery, and bought by Messrs. Readwin and Williams, who with a few others set them to work for copper and gold, with Capt. John

Parry as mine agent. The Dolfrwynog, Prince of Wales, and Cambrian Mines were all started to work for gold.

About this time Prof. Ramsay, referring to the discoveries of gold at these mines, wrote—"In the Ural Mountains, South Australia, Canada, and other parts of the world gold occurs in rocks of the same general age, and apparently under the same circumstances."\* There was, however, nothing of importance discovered until the end of 1862, when several bunches of gold were found in the forebrest of a shallow level, on the south side of the gold lode at Clogau, and early in the following year the gold appeared associated with yellow copper ore and telluric bismuth† generally diffused throughout the lode, and visible from the top of the level to the bottom. This discovery was the signal for the resuscitation of several dormant gold mines, and the creation of a host of new schemes, all of which have suspended operations, with the exception of Clogau, not so much on account of the paucity of gold as of the difficulty of extracting it by the means at command at the time.‡

The neighbourhoods of Dolgelley and Bala, for the present at least, comprise all the known Merioneth gold mines, and particulars to follow will be to some extent based upon papers on this subject in the "British Association Reports,"§ in which I treat of them as being in the Dolgelley and Bala districts. Briefly, the Dolgelley district is bounded by the River Mawddach, the Great Llawllech, or Merioneth, anticlinal range, and the River Camlan; to which may be added a continuation of 3 or 4 miles further N.E., following the junction, nearly of the Cambrian sandstones, and the Lower Silurian Lingula flags of the Geological Survey, and included in the Survey maps 75 S.E. and the upper part of 59 N.E. Of the geological features I only repeat the general statement, that the rocks are of Cambrian and Lower Silurian periods, forming a junction in a very sinuous course, and frequently cut through by narrow bands of porphyritic greenstone.

The district, as shown by Mr. Salter's report, is full of faults, and I will only add that the metaliferous veins have a general bearing N.E. and S.W., with an underlie generally to the north. There is a continuation of rocks of somewhat the same character for a distance of several miles, running in a N.E. direction to Castell Carn Dochan, in the Bala district.|| For convenience in my detailed description I shall divide the Dolgelley district into the following sections—Clogau and Vigra, Cambrian, Berthillywyd, Maesgwm and Cwmhesian, situated severally in the parishes of Llanaber, Llanelltyd, Llanddwy, Trawsfynydd, and Llanfachreth.

I shall conclude the present communication with repeating a former statement, that during the explorations gold has been found associated with iron pyrites, blende, galena, barytes, copper pyrites, slate, shale, schist, quartz, tetrahedrite, calcite, orpiment, tellurium and bismuth (in tetrahedrite), magnetite, platinum, platinum-iridium, silver, and copper, under circumstances of the most varied and intensely interesting character in a mineralogical point of view, if in no other.—Oct. 24.

T. A. READWIN.

## THE CARMARTHENSHIRE ANTHRACITE COAL AND IRON COMPANY.

SIR,—As another caution to the unwary, I shall feel obliged by your insertion in next week's Journal of the following account of the proceedings of this company, which is so far peculiar in its having had an excellent property, as admitted on all hands, and yet in the directors having succeeded in the short period of three years from its formation not only in spending the greater part of the paid-up capital, which already by successive calls had been increased to double the amount which was originally estimated to be necessary, but in landing the company ultimately in a position of such increasing indebtedness and embarrassment as to compel them to consent to a voluntary liquidation, and this without having ever paid any dividend after the first year.

The capital of the company was 60,000l., in 6000 shares of 10l. each, of which the vendor (Mr. B. Jones) took 1000 shares fully paid-up in part of the purchase-money, and 5000 shares were offered to the public, of which 3000 had been already subscribed, and it was stated in the prospectus that at their then rate of working the collieries could not produce more than 30,000 to 40,000 tons per annum, but that it was proposed at once to raise this production to at least 400 tons per day, or 120,000 tons per annum, and that an outlay of about 5000l. would effect this; that the demand then far exceeded the then power of supply, and that the company had arranged for acquiring the leases under which the property was held, together with the plant, tramways, &c., for the sum of 40,000l., of which 10,000l. was to be paid in fully paid-up shares (though it may be observed that in addition to these Mr. Jones, the vendor, also held 1000 shares which he had subsequently taken voluntarily, and upon the same terms as the other shareholders, and 30,000l. in cash, as follows:—8000l. on a day specified in the agreement, and the balance of 22,000l. in equal half-yearly instalments, and that a paid-up capital of 4l. per share on 5000 shares (20,000l.) would meet all requirements for a lengthened period; and that the properties had been valued by Messrs. W. Bird and Co. at 55,000l., including plant.

Now, there being nothing on the face of the prospectus to give rise to suspicion or enquiry, it is submitted that the subsequent shareholders who accepted the bait so held out to them had the most serious ground of complaint, not only against the directors but against their legal advisers, calling themselves at the same time solicitors to the company. When they discovered, only when too late, that under the Articles of Association their interest had been made entirely secondary and subservient to those of the directors, who self-appointed themselves, and practically unremovable, inasmuch as a majority of two-thirds in number and value of the shareholders is now required for that purpose, had also the entire nomination and appointment of all the clerks and officials, and, in fact, the uncontrolled management of all the affairs of the company, and had even stipulated that none of them should vacate his office on account of his participating in the profits of any contract or engagement with or of any work or business done for the company. Notwithstanding all this, however, the result of the directors' proceedings for the first financial year, which ended June 30, 1873, and for the first six months of which Mr. Jones, the vendor, was managing director, upon the whole, was very satisfactory. We had received very good dividends, amounting in the whole to 20 per cent. We had raised the estimated necessary working capital of 20,000l., or 4l. per share paid up, out of which we had paid Mr. Jones his 8000l. cash (although we had expended on the pit at Rhos 4391l. 14s. 7d., and on plant account 2198l. 17s. 4d.), and it was stated in the interim report that contracts were then offered to a far greater extent than the collieries were then able to supply, and at satisfactory rates. But at the meeting of shareholders, which took place on Aug. 29, 1874, for the second financial year, the increasing dissatisfaction of the shareholders with the conduct and management of the directors, symptoms of which had first appeared soon after the retirement of Mr. Jones from the practical management, began to display itself much more openly and emphatically, in consequence not only of our receiving no dividend, though a call had been made of 1l. 10s. per share, but that there was a debt of 1592l. 0s. 10d. upon the year's return, and that the amazing sum of 11,094l. 6s. had been expended upon the New Rhos pit, and 6435l. 12s. upon the plant account, though it must be borne in mind with reference to what occurred subsequently, that it was then voluntarily stated by the Chairman that they were in a position within a month to raise 400 tons per day of the finest coal in South Wales.

Now, before proceeding to the third and last meeting it will be necessary briefly to explain that on April 3 a printed circular had been addressed by Mr. Jones to each of the shareholders, containing the most serious and damaging charges and insinuations against the conduct and management of the directors, it being stated, among other things, that the then manager's report for the period ending

\* Monograph in the "Geologist," Feb., 1859. By Prof. Ramsay, F.R.S.

† Copper pyrites (Dana's chalcocyanite) and tetrahedrite.—T. A. R.

‡ The foregoing has been partly transcribed from a contribution of mine on "Gold in Wales," to "Ure's Dict. of Arts, Manufactures, and Mines." The article on "Gold," by another hand, will well repay perusal.—T. A. R.

§ See "British Association Reports," 1861, 1862, 1863, 1864, 1865, and 1870. By Prof. T. A. Readwin.

|| See maps, Geol. Survey, 74 S.W. and 75 S.E.

\* "Fert Britannia aurum et argentum et alla metalla, pretium victorie, gignit et oceanus margarita sed ambigua et trecenta." Tacitus, *Vita Agricola*, cap. xli.

† "History and Antiquities of the County of Cardiganshire" (1810).

‡ "Note on the Gogofau or Ogo-fau Mine, near Pampant, in Caermarthenshire." By W. W. Smyth, M.A. "Memoirs of the Geological Survey of the United Kingdom."

§ See "Lectures on Gold," delivered in the Museum of Practical Geology.

|| Epist. ad Famil.

¶ Sir John Pettus, *Fodina Regales*.

†† Flowden, 338: Black, "Com.," Stephens's edition, 1853, vol. ii., p. 556.

‡‡ "Inst.," 139; 2 "Inst.," 676, 1861.

§§ See "The Law relating to Mines, Minerals, and Quarries in Great Britain and Ireland." By Arundel Rogers, Esq.

\* Rogers v. Brenton, 10 Q.B., 40.

† The terms have been somewhat altered since the above was written, which will be stated hereafter.—T. A. R.

‡ I found gold easily enough, four years ago, when near Leadhills.—T. A. R.

§ See Smyth, "On the Mines of Wicklow." "Memoirs of Geol. Survey of Great Britain."

|| "British Gold, with especial reference to the Gold Mines of Merionethshire." By R. Hunt, F.R.S., "Quarterly Journ. Science," 1865.

¶ "The Gold Discoveries of Merioneth." By T. A. Readwin, F.G.S., 1860.

†† "Notice respecting the Discovery of Gold Ores in Merionethshire, N. Wales." By Arthur Dean, C.E. "British Association Reports," 1861.

‡‡ "On the Occurrence of Gold in Merionethshire." By T. A. Readwin, F.G.S. "British Association Reports," 1861.

§§ "On the Geology of the Gold Bearing District of Merionethshire." By Prof. A. C. Ramsay, F.R.S.



1873 had pointed out great irregularities by which the company were heavy sufferers, and to which he begged to refer, through it has never yet been publicly exhibited to the shareholders; that the last balance-sheet showed an asset of £7011. 3s. 5d. for coal in stock, but that the greater portion thereof had been absorbed in current expenses, consumption of fuel for engines, &c., and waste; that the pay sheets for that period would give some idea of the increased cost of our coal by stocking, enormous depreciation through breakage, and, more important, that the quantities could not be checked; that all this had arisen for want of making sales; and that our self-appointed salesmen—Messrs. Bird and Co.—had really no connection in that description of coal; that no director should have interests antagonistic to his company, and that much unpleasantness had arisen from this cause, since he was obliged to object to a great many charges made against the company, and these objections had to be allowed; that there were still many such charges which should be taken off, and much coal which should be accounted for, and, indeed, that there were very many other most important matters which they should seriously consider; that accounts had been much complicated by being partly kept in the London office (which had been very costly) and at the collieries, and that the late clerk was not satisfied with the vouchers sent him from London; and concluding by demanding that a committee of investigation should be appointed. Now, it is scarcely, I think, credible that the only notice vouchsafed by the directors to the foregoing letter prior to the next and last meeting of the shareholders, on the 13th inst., was by a letter, dated April 19 last, addressed by them to each of the shareholders, in which they simply say that under legal advice they were commencing an action against the vendor under the supplementary purchase agreement, and that the extraordinary remarks of Mr. Jones might well be left unnoticed, since, at the proper time and place, he would have every opportunity to repeat and substantiate them. As to the supplementary purchase agreement, it was simply a deed by which Mr. Jones guaranteed an annual output of 30,000 tons for the next six years, it being abundantly clear that the property is equal to a much larger output than that, so that in precipitating the company into costly, and probably useless, litigation with Mr. Jones upon merely their own *ipse dixit* and that of their solicitors, without any attempt being first made to ascertain the views of the shareholders, as indicated at a general meeting.

The directors, it will be seen, therefore declined the enquiry which he so urgently called for, and put him to the disadvantage of the inability which he would labour under of proving personally and in his own defence many things which could only be elicited by a committee with all its means and appliances. It was not, then, until the 7th inst.—more than a year after the last meeting—that we were apprised of two several meetings of the shareholders to be held on the 13th (the short notice and the inconvenient season for the consideration of the most important questions will be manifest), and though Mr. Jones on that occasion was enabled on many most serious questions to prove his case with the most overwhelming written and living testimony, and on others at least to show the very gravest grounds for suspicion, the directors on that occasion, as from the first, never evinced the slightest disposition to yield to Mr. Jones's demand for a committee, but, on the contrary, only manifested the utmost coolness and indifference to the feelings and wishes of all the independent shareholders; and, perhaps, the only consolation we can lay up for ourselves is that in carrying a resolution for winding-up the company voluntarily they have fortunately hit on the only course which under such circumstances could be satisfactory to us.

I cannot enter into the various questions arising upon the last statement of accounts, as such accounts have been invariably so vague, meagre, and unsatisfactory as to require a length of time to be understood even by a skilled accountant; and, of course, he always takes for granted that the various items are correctly stated as given to him. There is, however, one point to which I will advert—How does it happen that Mr. Jones, before the possibility of any large expenditure to increase the output, was yet enabled for the first six months to pay us a handsome dividend, whilst the present directors (after it has been manifest to everyone that the works were capable of raising a much larger output than they were able to sell, and that they were repeatedly and constantly losing to a large extent by stocking, crumbling, and waste, and though paying us no dividend whatever) have continued in making calls to the extent of doubling the paid-up capital originally estimated to be necessary, all of which they state to have been expended upon the works, and have managed ultimately to place us in a perfectly fatal state of indebtedness and embarrassment.

Whether such a state of things can be consistent with any amount of business-like dealing and decently good management I leave for others to determine. All that I know is this—that we have probably lost the greater part of our paid-up capital, and that the how and the why could only be fully shown by such an investigation as has been coolly and persistently withheld from us.

OCT. 27.

A SUFFERER.

## SEPARATION OF LEAD AND BLENDE.

Sir,—There are several mines in Cornwall and Devon which would not doubt have obtained a position in the Dividend List long since but for the difficulty of separating their lead from the blende with which it is associated, for although both lead and blende are valuable when separated they are comparatively worthless in combination, owing to the inconvenience of separating them in the smelting process. It is in consequence of the raising of ores of this class that a multitude of mines have so long remained unremunerative, and there can be little question that a fortune is in store for anyone who can devise a remedy capable of easy practical application. As the specific gravity of lead and blende are not identical the separation can be effected by expert manipulation, but unfortunately this cannot always be ensured on the dressing-floors of a mine; some system must, therefore, be devised to secure the same result with such labour as is at hand. It seems to me that the first step in all separations of this kind is to size the ore (and the closer the two metals to be separated correspond in specific gravity the greater must be the care exercised in this respect), for then the difference in the absolute weight of the several particles is taken advantage of. Every effort should be made to avoid reducing the ore to powder, for it will be found that the flour is not so easily separated as grains of ore, which should never be smaller than rape seed. With ore of this size I have seen blende and lead separated with the ordinary Saxon jigging machine so well that the undivided portion did not exceed 5 per cent. of the mass, the remainder being pure lead ore and pure blende respectively. But in this case the three layers on the sieve (which, should remark, do not lie quite horizontally) were taken off by an old man who seemed to well understand his business, and he, certainly, appeared slow compared with an Englishman. But the work was done, and done properly, the result being that whilst the mixed ores would not have sold for 5s. per ton, they averaged (including from 12 ozs. to 15 ozs. of silver to the ton) nearly double. The 5 per cent. remaining mixed was thrown aside, and the old man told me that the chemist was testing this, and hoped to get white lead and zinc white out of it by a precipitation process.

Here both the lead and the zinc ores were made marketable at the best prices, and large profit resulted. The extraction of the white lead and zinc white may, of course, be looked upon as impracticable. Now, why could not some similar process be adopted in this country? The whole question of sizing and separating ores was well discussed some time since in the *Mining Journal*—I think by Mr. J. Darlington—and it was shown that by mechanical means the sizing could be very perfectly accomplished. Now, assuming this to be the case, and no one who has seen the process of ore dressing as carried on at a German mine can doubt it, I think we are justified in saying that inability of those entrusted with the management of mines in Cornwall and Devon is the sole cause that many of the properties yielding blende and lead associated with each other remain unprofitable. It is an acknowledged fact that as working miners Cornishmen are unparagoned, but they are so lamentably ignorant and conceited that they fail to make profits out of what Germans would consider marvellously rich ore. There are many places in Cornwall where it would pay to import a few German dressing masters to perform or

superintend the portions of the work requiring skill and intelligence, leaving the Cornishmen to do the heavy manual labour, as at present. If this were done even the Cornishmen would get higher wages than at present, because ore which is now sold at a loss would realise profits for the adventurers, who would then become more liberal and enterprising. Home mining has been depressed long enough, and anything that would tend to revive it by giving profits to those who have invested their money in it should at least have a trial.

OCT. 26.

ADVENTURER.

## THE DOWSING ROD.

Sir,—All the letters of the scientific gentlemen who have treated on this subject have afforded me considerable pleasure and satisfaction, and what I could not account for before seems clear to me at present. I am thoroughly sure that the divining rods, if handled properly, precisely the same as a galvanic battery administered to the person. There is one delusion of Mr. Spargo's, who has put down my late brother Matthew as an unbeliever in the dowsing rod. Now, I can only say that from him I got most of my information respecting it, and we have often been dowsing together, the rod acting always and on every occasion with both of us in precisely the same manner. I remember going over the Frongoch Mine and lode with the rod, when one of the agents came out laughing and bawling, and asked me what I was about. I told him, and gave him the rod to hold, when, much to his surprise, he was unable to keep the rod from bending. Another gentleman, an unbeliever, I induced to handle the rod over the same lode some miles east, and he thought (so he told me) that the devil was in the rod.

I have never cared to make people believe in it; let them do as they please, and they will reach their destination all the quicker. I observe that "Scrutator" thinks he was the means of my bearing testimony to the virtue of the rod. In this he is mistaken. I did so that all might try and believe, or, if not, they could accommodate themselves without giving it a trial. As to the numerous letters of Mr. Kneebone and others (if Mr. Kneebone wrote them, for it is all the same in Greek), about the trial of pence and watches, I treat them for what they are worth. I presume every man who has read these letters which have appeared in your valuable columns will be much of the same mind as myself in saying they are most absurd, and not worthy the space they have occupied.

Goginan, Oct. 26.

ABSALOM FRANCIS.

## DOWSING AND DIVINING.

Sir,—You were so good as to publish my letter of Sept. 14 in the Supplement to last week's Journal, and that has rendered it almost needless to reply to the letter in which Mr. Spargo attacked my statements, and flatly contradicted them in the most unceremonious manner. I am surely a better authority as to the position held by Archbishop Whately on the council of the Mesmeric Institution, Weymouth-street, than any City man in commercial life, for he was my mother's uncle, and I had his statement on mesmerism from his own lips, and he was a most truthful man, and he told me he had cured a woman of blindness, caused by paralysis of the optic nerve, by mesmerism, though her blindness was of 20 years' standing; and, further, that he had proved its efficacy on his own carriage horses, which not being professional practitioners of falsehood and fraud could not conspire to deceive him. Spargo's shameless libels on two honourable men, who certainly sacrificed the lucrative profession of allopathy for the less lucrative, less dishonourable, and less dishonouring profession of homeopathy and mesmerism, is too stupid to be worth notice if it were not mischievous to allow a libel to circulate without contradiction. It is quite true that poor Dr. Elliotson was defrauded out of the capital he had acquired in his honourable career in the latter end of his life by being fooled by City men, who tempted him to invest it in fraudulent schemes and bubble companies. It was a conspiracy of stock-jobbing dealers which ruined him in his declining years, and left him in poverty and impecuniosity after a life of successful toil. You will be surprised to hear that Dr. Ashburner is still living, and by no means in a garret, nor in need of charity. He lives in a fashionable quarter of the West End, and, although very old and infirm, retains the friendship and esteem of many honourable men and gentlemen of high standing in society, who hold the opinions which he holds, and practice his precepts with the greatest success. Dr. Elliotson lost a portion of a very valuable practice by his honesty, because he was a pioneer of progress, and refused to bow to the miserable prejudices of the orthodox leaders of the profession; but he, too, lived in a fashionable quarter of the West End, in a very expensive house, and so far from being dependent on charity, was charitable enough to give the world the benefit of his extensive experience in his new sphere of work in the columns of the "Zoist," a magazine of mesmeric science which he edited, and which now commands a very high price, because it is out of print, and known to be one of the most valuable repositories of information on a most important subject.

Your correspondent most uncivilly and flatly contradicted me as to the facts of my own relative's connection with mesmeric institutes, although he is so utterly ignorant of everything connected with him that he does not even know how to spell his name. The late Archbishop of Dublin, whose patronymic is as well known as that of the Archbishop of Canterbury, was patron of the Mesmeric Institute in Weymouth-street, and his name was printed in the circulars of that Institute as its patron, and he is not the only Archbishop who has recognised the fact that mesmerism is a grand subject of scientific interest, and no fiction. The present Archbishop of Canterbury is as familiar with the subject as Dr. Whately was, and by no means disposed to quarrel with me for calling his attention to it, as I have done in the most satisfactory manner by contributing literature to his library table, which he has most liberally promised to read; and he is as well acquainted with my views on the subject of pneumatology as any reader of "Scrutator's" letters can possibly be. He is not a bigot of the puritanical type, who quarrels with his neighbours and friends because they conform to their own views of truth, and dissent from his orthodox teachings. He is a practical preacher, who practises the charity he preaches, and does not withdraw from the field, and leave it in the possession of those who differ from him, as the Irish Protestant clergy did from the National Schools of Ireland, to Archbishop Whately's extreme sorrow, because they could not have everything their own way, and would not co-operate with the Catholic priests. The Archbishop told me himself that he considered that his clergy had committed moral suicide by their arrogance and their pride in withdrawing from the National Schools; and he sent me to see a parish in which the rector had acted on his principles, and retained the mastery of the National School, because the Pope's brigade had withdrawn from co-operation with him, on the absurd principle adopted by its Protestant neighbours.

Your correspondent will forgive me for saying that he is entirely in the dark as to my patronymic if he means to suggest that W is its initial, and equally in the dark as far as acumen is concerned, if he cannot see the practical weight of the evidence adduced in your columns in favour of the extreme utility of the dowsing-rod. I think you are sufficiently aware of the fact that the evidence in its favour is as strong as evidence can possibly be, and that if Mr. Spargo and his friends prefer to believe in wild assertions and simple falsehoods rather than in the plain statements of facts by such independent witnesses as this correspondence has elicited, he must be in the position of the blind leader of the blind who would conduct his followers into the ditch, from which he could never dig them out until he had exhausted their resources and finished their fun.

You will forgive me for using my common sense, and continuing my correspondence without further noticing such critics and commentators as Mr. Spargo and the crew who cannot contradict me without flatly contracting a final stain on their own reputation for veracity, and cruelly libelling a scientific sage now in a dying state and unable to defend himself. He is intimate with my intimate friend, Henry Stafford Thompson, of Moorlands, near York, a well-known sporting squire and sportsman-like squire, who has himself practised therapeutic mesmerism for 30 years, and performed the most miraculous cures in cases which had baffled the skill of Paget and Ferguson; and he was an intimate friend of Bulwer Lytton when he wrote "Zanoni" and "The Strange Story," and supplied from his own note-book and his own personal experience many of

the most marvellous incidents in those marvellous works, which are generally credited by the orthodox indignant critic with the wildest sallies of supernaturalism and the most imaginative insults to common sense. But common sense is the product of personal experience, and common sense is the common sense of the community who have no exceptional experience. Uncommon sense is the result of exceptional opportunities of observation and experience, and mesmerists such as Lord Lytton, Archbishop Whately, and Mr. Thompson, all intimate with each other, are men of uncommon sense and uncommon experience. Common sense would lead wise men to respect uncommon sense, instead of attempting to scoff and sneer at their conclusions. Mr. Ashman, the psychopathist, of 254, Marylebone-road, is following in their footsteps, and founding a new mesmeric hospital, which will ere long rival Dr. Esdaile's celebrated institution, under the patronage of the Government of India, at Calcutta. I have done with Mr. Spargo and the irrational fellows who tread in the paths of precedent, and stick to the presumptions of former fellows of the faith, whose traditions were handed down from antediluvians, and ignore the progress which science has made, and science itself. Such are the fellows who write R.C.P. after their names, which, being interpreted, means Royal College of Physicians in their own society by courtesy, but Royal College of Quacks in reality, and most pernicious quacks too. Did your readers know what I know of physiology they would never admit a F.R.C.P. to the society of their sons or their daughters, their wives or their families. *Verbum sat sap.*

SCRUTATOR.

107, Ebury-street, S.W.

## THE DIVINING ROD.

Sir,—Kindly grant me space in your valuable Journal to bring under the notice of your numerous correspondents my theory for the explanation of the phenomena in dowsing. It is an established fact that magnetism exists in the animal, vegetable, and mineral kingdoms; and it can be detected in all matter with the aid of a magnetoscope. In man it has been seen issuing at the tips of the fingers as a faint blue light. In graveyards it has been seen escaping through the tombs from the decomposed bodies therein. This fluid is capable of magnetising various matters, as has been proved by that denomination calling themselves spiritualists. I have seen a spirit-medium, who had a small wooden table so susceptible to magnetic influences, that when he held his hands over it the attractive force was so great as to cause it to leave the ground.

My theory is based on the above facts, and is as follows. The magnetic fluid, emanating at the tips of the fingers, enters the pores of the dowsing rod while the hands of the dowsers are in contact with it, thus converting the rod into a magnet, which throws off its attractive force the same as other magnets do. All magnetic bodies, such as minerals, emanate a magnetic fluid. When the force—excited by the fluids emanating from the dowsing rod and mineral or other magnetic body—surpasses the restraining force of the intervening air, they force their passage through the air, and, rushing towards each other, combine. This movement is attended with the dipping of the rod. Persons in whom magnetism is at a high degree are more efficient dowsers than those who possess it only at a low degree; hence the reason why all cannot dowses. It does not matter whether the rod used be a blackthorn, hawthorn, currant, or hazel, provided it is green, or newly plucked, because they are all susceptible to magnetic influences, but more so when fresh gathered. The fact that gloves worn on the hands detract from the attractive force goes far to prove the above theory.

Whilst the dowsers are walking on with the rod in his hands, perchance he passes over a piece of iron buried in the earth, and hidden from view; this piece of iron, being a magnetic body, would attract the rod, and may be taken by him for a mineral lode, and much time and money would be wasted thereby. Hence, it follows, the rod is not a true detector of mineral lodes; although it may be used for the discovery of such lodes.

T. H. W.

Redruth, Oct. 20.

## DOWSING.

Sir,—As long as this vexed question remained in the category of simple argument there might not, perhaps, be any great harm in the matter, but when it is attempted to be made the "medium" of a gigantic scheme to lure the investor of capital into the Elysian fields of spiritualism something may as well be said by way of testing the feasibility of the scheme. "Scrutator," in his voluminous and hyperbolic lucubrations, evidently has great confidence in the credulity of his readers, as the following example will make tolerably manifest. He relates a story of the loss of some family deeds which were recovered by means of clairvoyance after the following fashion:—The clairvoyant medium, a merchant seaman, came and set with a lady interested in the recovery of the deeds, and on putting the question to the spirit world as to the present place of deposit of the said deeds waited for an answer. It came. They asked for a fortnight's delay to make enquiries for the missing documents, and at the end of that time the *seance* was repeated, and then a message was given that Exeter was the place in which the missing deeds were to be sought. The owner then set to work to reflect what connection he could have with Exeter, and it occurred to him that Dr. Boyd, the present Dean, had been an intimate friend of the family, so to Dr. Boyd the owner wrote, and lo and behold the deeds were found. Now, I imagine that the fact of the spirits requiring a fortnight "to make enquiries" will appear to most people a somewhat singular occurrence, but what will be thought of these unkind spirits when it is known that they actually refused to give any further information, and that "finding it useless to expect further aid in that quarter" the message was sent to the owner of the deeds as it stood.

This, in the 19th century, being the kind of visionary matter so constantly paraded before the public, is it at all to be wondered at that Professors Huxley and Ferrier will have no more to do with the propagators thereof. We are told, for instance, that Mr. Welton's wife is able to see the contents of a mineral sett, and to indicate the position of the principal lodes, whilst in a trance, and this is the foundation on which a colossal mining syndicate is to be raised, and which is to cast the experience of mine captains and practical men generally into the shade. It will be observed as a noteworthy fact that no investor is to be admitted into this mystic circle unless he is prepared with a substantial sum "expressed in four figures."

I crave leave to enquire of "Scrutator" why he should be so uncharitable to his poorer neighbours as to exclude them from a modest share in the El Dorado he sees so clearly before his eyes, and what particular occasion there can be for such an enormous capital, when, according to his own words, he, like Mrs. Welton, "can tell to a certainty what minerals are contained in any given lode?"

OCT. 26.

A MINE AGENT.

## UNDEVELOPED MINERAL GROUND OF CORNWALL—RESUSCITATION OF DEEP ABANDONED MINES.

Sir,—I may, perhaps, not be considered intrusive if I solicit space for a few remarks on the comparative merits of these two kinds of undertakings, especially as there just now seems a desire for enquiry into the real state of mines. That the resuscitation of old, worn-out, deep, and expensive mines are anything but profitable to the shareholders can be proved on reference to the expenditure and results attending such, the amount required for the working of one of such concerns being sufficient to develop a dozen mines in new ground, and with every chance of success, while the other is something like opening the oyster shells and finding nothing left.

There has, unfortunately, been too much of this kind of mining in Cornwall for the last 20 years, the only parties benefited being the merchants. There is seldom any difficulty in getting merchants to join an enterprising person in bringing out concerns which must necessarily require large quantities of all kinds of materials.

It is high time that the outside shareholders should have some return for their capital, and encouragement to invest more. I am pleased to see some such mines as I have advocated springing into a dividend state, and that, too, after the expenditure of only a small capital. I notice Balmynheer, in Wendron, with a called up capital of 7000*l.*, has just entered the Dividend List, with every prospect of continuing there; here they have one of those carbonates, or, as



CHAS. BAWDEN.

G. BEDFORD, Sec.

Oct. 28.

*Penzance, Oct. 26.*

EDWARD MICHELL, Purser.

[For remainder of Original Correspondence, see to-day's Journal.]

**THROAT IRRITATION.**—The throat and windpipe are especially liable to inflammation, causing soreness and dryness, tickling and irritation, inducing cough and affecting the voice. For these symptoms use glycerine in the form of lozenges. Glycerine, in these agreeable confections, being in proximity to the inflamed parts, is acted by the act of sucking, becomes actively absorbed, and its action is rapid. For the cure of this complaint, use the following healing: 6d. and 1s. boxes (by post 8 or 15s. any), and 2s. 6d., labelled "JAMES EPPS AND CO., Homoeopathic Chemists, 45, Threadneedle street, and 170, Piccadilly, London.

A vote of thanks to the Chairman and directors terminated the proceedings.

out a profitable sect of ground for 20 fms. high when measured in the underlie of the lode. The 82 end west is worth 8¢. per fathom. The 70 end, west of King's, is worth 12¢. per fathom, and looks likely to improve. The 70 end west is worth 7¢. per fathom. The winze below the 60 west is worth 30¢. per fathom; this is a good lode, and I expect to intersect the 70 end lode in the 70 fms. I intend to go 70 to intend to put up a trial rise above the 60 to prove the lode, which is standing whole to surface. The stope in the back of the 70, under the winze referred to, is worth 30¢. per fathom. The ground in the 80, east of Fraser's, is easier for driving; we have an opinion that we shall soon intersect the run of tin ground seen in the 30. We are driving north on the cross-course at the 50 to intersect the great lode, and the 50 end of the cross-course is worth 12¢. per fathom. The lode in the 60, east of the cross-course, is worth 72¢. per fathom. The best adit east of engine-shaft, on the middle lode, carries good stones of tin, and the ground easy for driving. There has lately been a great addition made to the sett on the south-west; this new ground not only enable us to follow the great lode some 150 fms. further west, but we can prove it to any depth. It also embraces the whole of the middle lode, and the 50 end of the other group of lodes about 130 fms. further west. The 50 end of the cross-course is worth 12¢. per fathom. The lode in the south lodes are spoken very highly of by the former manager as being productive for tin, which was neglected in times gone by. Our attention, however, is for the time directed to developing the north part of the sett, or the Wheel Grenville and the South Condorow lodes. We have commenced a trial shaft near the Wheel Grenville lode, and have sunk it 20 fms.; we purpose sinking a few fathoms deeper and then cut a cross-cut to intersect the 70 end lode. In addition to our opinion we shall soon open out productive ground in this new grant, in addition to any discoveries that may be made in South Condorow proper. We have sold

be commenced. Capt. Powning, who had had the management, said he had done



the best he could under the circumstances, and the directors had supported him; and he (Mr. Watson) did not think their present Chairman could have done otherwise. Personally, he attached great importance to the opinion of Capt. Waters, who had been practically acquainted with the district for a number of years. Capt. Waters had confidence in the future of the mine; but capital must be provided, otherwise the property must be sold. This would be a very great pity, seeing that a depth of only 37 fms. below adit had been reached. There was no doubt by the vigorous prosecution, by pushing down the shaft, something good would be the result.

The CHAIRMAN said he did not mean to reflect in any way upon the directors, because no one could see through the ground, and judgment could only be formed by what was seen. The present pumps were inadequate, whereas the engine itself was fully adequate for all their requirements.

Mr. PETER WATSON mentioned that the district in which these mines were situated had been worked by his uncle many years since. A series of mines were developed, and the engine which was placed on the Tankerville Mine was originally purchased for the development of what was now known as South Roman. By some means or other the engine was taken to Tankerville instead of Gravelly. The property in which this company was now interested. Mr. Broderick has stated that some years ago no set in the district was said to possess better prospects than this. According to indications, there was reason to expect this property would yield results equalling any other mine in the district.

Mr. J. Y. WATSON drew attention to the fact that the lode had increased in size from a few inches to 14 feet, and was full of vugs, like that at Tankerville.

The CHAIRMAN remarked that the shaft had been so altered as to be sunk on the course of the lode, and already spar was found mixed with the greenstone.

A SHAREHOLDER enquired what the directors were prepared to do in subscribing towards the debentures?

The CHAIRMAN said he was prepared to take his full proportion, so did Mr. J. Y. WATSON.

Mr. PETER WATSON said as Mr. Wilson, the other director, was not present the question could not now be fully considered.

The resolution was then put and carried unanimously, and votes of thanks to the Chairman and directors concluded the proceedings.

#### DENBIGHSHIRE CONSOLIDATED MINES.

An extraordinary general meeting of shareholders was held on Wednesday, at the offices, Great St. Helen's, for the purpose of passing the following resolution:—"That power be given the directors to issue the 2195 reserved shares of 3l. each, at a discount of 30s. per share, to be first rateably offered amongst the present holders of shares in the Denbighshire Consolidated Mines (Limited), as entered in the register of members. The chair was occupied by Mr. F. RUDALL. The notice calling the meeting was read by Mr. E. J. BARTLETT, the secretary.

The CHAIRMAN said a meeting was held a short time ago for the purpose of discussing the state of the mine, and also the financial affairs, which the directors had had under consideration. The shareholders had received a letter dated the 19th of this month, which stated that the proposal which had been made at the previous meeting to issue debentures had not received the general support of the shareholders, and the directors had, therefore, determined to issue the remaining shares at a discount of 30s. per share—15s. to be paid at once, and the remaining 15s. in February, 1876; so when that was paid there would be no further liability. Since the determination of the directors to issue these shares had become known the application for them had been steady. He moved the adoption of the resolution given above. He did not know that any remarks were necessary. In the event of the resolution being passed it would have to be confirmed at a future meeting, to be shortly held. There was now every appearance of the near approach of the success which they all hoped for and expected would come. They were now within a few yards of a body of ore, which they could not work some time since in consequence of the water. The directors were making every effort to keep down expenses at the mine, and the work of discovery was being proceeded with as rapidly as possible. He hoped that in five or six weeks the directors would be able to make an announcement respecting the ore existing at the bottom of Parry's shaft, which would be satisfactory to all.

Mr. COOPER said he should have great pleasure in seconding the resolution, believing as he did that the mine would turn out trumps. He had been on the mine twice, and had been perfectly satisfied with the work which had been done, and could well understand how the money had been spent. By the issue of the shares at a discount of 50 per cent. the shareholders would be able to average their holdings, and he believed in a short time the shares would be at 30s. premium. It was more than human to command success, but he was perfectly satisfied with the way in which the secretary, the directors, and Capt. Pryor had carried out their duties.

Mr. E. J. BARTLETT said that since the report had been in the hands of the shareholders the directors had received responses from proprietors, but he might say that it still remained for a great proportion of the shareholders to send in their applications. With respect to the affairs of the mine, in his speech at the meeting, on Wednesday last, he endeavoured to convince the proprietors that if they visited the mine they would be satisfied with the operations, and that the expenditure had been judicious. There were many proprietors waiting for the carrying of this resolution before they sent in their application, but as soon as the resolution was carried they might expect to swell the list, and he hoped the number would be complete at the earliest opportunity. The sooner the applications were received for the shares the better, as the more quickly could they carry the junction shaft to the proper depth, which they had reason to believe would command the ore existing below the level of the 112 west. The shareholders would have the opportunity of taking the *pro rata* proportion, but if they were not taken by the shareholders they would be offered to the public, and he had no doubt whatever they would be taken up. It was useless for the directors to increase operations unless they saw their way clearly in financial matters. By making the payments 15s. down, and 15s. in February, they would come easy to the shareholders. The prospects of the mine were now very satisfactory, and if the shareholders did not come in and take their proportion of the shares they would only have themselves to thank if the public came in and got hold of a good thing. (Hear, hear.)

The resolution was then put and carried.

Mr. BARTLETT stated that the confirmatory meeting will be held on Friday, Nov. 12 next.

#### GUNNISLAKE (CLITTERS) MINING COMPANY.

A four-monthly meeting of adventurers was held at the mine on Monday, Mr. J. C. ISAAC, of Liskeard, presiding. That gentleman, prior to reading the statement of accounts, congratulated the shareholders that they met under such favourable circumstances, and that they had for the first time assembled in their new account-house. He looked upon this as an indication that the agents believed that in Gunnislake (Clitters) they had a permanent and valuable mine, and he hoped they would continue to meet under similarly favourable circumstances for very many years to come. The accounts showed that the credit balance brought forward from the last meeting was 1051l. 13s. 3d.; the sales of copper ore had realised 3210l. 5s., and discount on merchants' bills 13l. 4s. 6d., making the total credit 4275l. 2s. 9d. The expenditure included 1605l. 2s. 10d. for labour costs from May 29 to Aug. 21; 455l. 14s. 10d. for merchants' bills; 135l. 6s. 11d. for dues; and 8l. 4s. 9d. for sundries; leaving a profit of 999l., and a balance in hand of 2040l. 13s. 5d.

Capt. SKERRES read the agents' report, which said: "In our report for the meeting on June 21 last we called attention to the shaft being sunk to the 188 as quickly as possible, and this is now accomplished. The lift will be fixed forthwith from the 176 to the bottom, and we shall commence a cross-cut to the lode by the end of the week, which (looking at the course of ore gone down in the bottom of the 176) will cut equally good in the 188, seeing that the granite in the bottom of the shaft is similar to that in the 176. The lode in the 176 east is worth 8l. per fm., and in the rise in the back it is worth 15l. per fathom. In the western end the lode is worth 6l. per fathom, and in the rise in the back (about 4 fms. behind the end) it is worth 17l. per fathom. The slope in the back of this level is worth 15l. per fathom. In the 164 west the lode is worth 10l. per fathom, and in the wizen sinking below it 17l. per fm. The eastern end is suspended for the time, and the men put to rise in the back of the level to increase the ventilation. In this rise the lode is worth 11l. per fathom, and in the stopa in the back it is worth 9l. The lode in the 140 west is worth 8l., and the stopa in the back are worth respectively 7l., 9l., and 10l. per fathom. In the 128 west the lode is worth 6l. per fathom, and in the stopa in the back 15l. In the back of the 116 west the two stopa are worth together 24l. per fathom. We think it well to remind you that within the next two months we shall have to case the shaft, take out the penthouse, and fix the skip-road from the 176 to the bottom; also to cut, plat, and prepare for sinking to the 200 without delay. We hope to accomplish this and another 12 fms.—making the total depth 212 fms.—in the course of another year, by which you will see that the mine is being opened up in a spirited manner, and with a view to increased profit."

The CHAIRMAN stated that in the accounts everything was charged up to Aug. 21, both labour costs and merchants' bills; and they were not only charged up but, with the exception of the dues, were all actually paid. That was a state of things which they would not find in many mines either in Devon or Cornwall, that at a meeting held towards the end of October all the costs should be charged up and paid to a very recent date. No ores were credited in the present accounts but those that were

entitled to be credited. Next week another parcel of ore would be sampled, the cost of which would have been incurred since these accounts were prepared. The profit on the last four months was 999l., but at the end of the year the extra month's costs would have to be charged, for which, of course, they ought to make preparation. At the last meeting they set aside 100l. for this purpose, and the committee were of opinion that at this meeting they should set aside a still larger amount, so that when they met four months hence they would be able to pay off the extra month's costs without interfering with the regular working of the balance-sheet. This would reduce the balance of 999l. to about 890l., and the recommendation of the committee was that a dividend of 1s. 6d. per share should be declared. This would absorb 737l. 5s. 6d., and they would still have a capital balance in hand to meet any contingency.

Mr. W. MATTHEWS added that the committee thought it would be better to give a 1s. 6d. dividend now and a 2s. dividend next time, than 2s. now and 1s. 6d. next time, as a reduced dividend at the next meeting might have a deteriorating effect upon the value of the shares. But for the extra month's cost which they would have to meet a dividend of 2s. might have been declared at both meetings.

The report and accounts were then passed, and a dividend of 1s. 6d. per share decided upon. The committee were re-elected, and the Chairman having been thanked for presiding the meeting terminated.—*Western Daily Mercury.*

HERODSFOT.—At a meeting of adventurers held at the mine, on Oct. 19 (Mr. Matthew Loan in the chair), the accounts showed a profit on the four months' working, from May 1 to August 21, of 10l. 4s. 8d., a balance of assets over liabilities of 1644l. 9s. 8d., and a cash balance of 1009l. 2s. 11d. Messrs. Loam, Hawke, and Isaac were elected members of the committee. Capt. Trevillion says—"Our machinery continues in a very sound and satisfactory state, and I am glad to say that the Captain's plan of working the mine, and carrying on 100l. towards the twentieth month, which will be included in our next four months' returns. I have laid the mine as clear as possible before you, and you will see there are three interesting points—the next level, the 190 south, and the 106 south—and I am of opinion that success will attend our operations."

WEST TOLGUS.—A very satisfactory meeting was held on the mine on Monday, Mr. R. Taylor presiding. A dividend of 25s. per share was declared, and the shareholders were informed that enough copper ore had been already sold to ensure a similar dividend at the next meeting, as well as to meet extra unavoidable expenses which would be incurred in getting the engines into a proper state of repair, and besides this 220 tons of ore had been sampled for the meeting after the next. In reply to questions from the Chairman, Mr. Hooking, the engineer of the mine, stated that they had been much disappointed at not being able to put the new whim-engine to work that day. He was, however, perfectly satisfied that it would prove an economical machine. He had seen diagrams taken from it before it left the works, and these were very satisfactory. The boiler had been specially constructed to work with steam at a high pressure, and it had been recently tested to 140 lbs. per square inch. It reflected very great credit on the builder, Mr. John Thomas. As soon as the new whim was set to work they proposed to re-model the present crusher, and with the alterations in contemplation at Taylor's engine a reduction in consumption of coal might be expected and an increased duty from the engine. Captain Hooking inquired if the new drawing engine had been paid for. The Chairman replied that it had been, and that before the winter was over all the engines would be in good working order.

#### THE MINERAL RESOURCES OF THE SOUTH-WEST OF IRELAND—No. XXVI.

[FROM OUR SPECIAL CORRESPONDENT.]

I remarked in the first of these papers that if a line were drawn across the map of Ireland from Roaring Water north to Bantry, and from thence north to Kenmare, County Kerry, the districts of West Cork and West Kerry, west of such north and south line, were the richest undeveloped mineral ground in Europe, that the natural facilities and advantages for carrying out extensive operations could not be surpassed, and that the extensive, safe, and beautiful harbours of West Cork were unrivalled, while the minerals of all descriptions were equal in value to the produce of any part of the globe.

In concluding for the present my rough sketches, I may be permitted to remark that my descriptions of "The Mineral Resources of the South-West of Ireland," however imperfect and hastily written, are from careful personal observation and inspection. I have also traversed and examined most of the country from Cape Clear to the mountains of Donegal, but in West Cork and West Kerry there is ample scope and a fair field for the safe and profitable investment of millions sterling. For instance, there is the great copper zone, embracing numerous lodes, extending from the Brow Head to East Cappagh at the head of Roaring Water Bay, including the mines of Brow Head, Mizen Head, Crookhaven, Collera, Coosheen, Ballycumisk, Horse Island, Cappagh, and East Cappagh. Then there is the parallel copper zone, extending from the Mizen Head and Three Castle Head to Shronagroe, and in this great mountain range are the mines of Balteen, Dhurode, Lackavane, Mount Gabriel, Ballydehob, Derryearhoun, and Shronagroe, and at Dreenalmon, on the western slope of Mount Corin, there is the largest and purest deposit of the sulphate of baryta yet found in the United Kingdom.

Next we come to the great copper zone in the peninsula of Minter-vauria, extending from the Sheep's Head to Durrus, and the copper valley of Coomkeen. From the trifling explorations which have been made in this mountain range, there is sufficient seen to justify the expectation of its becoming one of the most extensive and richest copper districts in the kingdom; it embraces the mines of Gurtavally, South Berehaven, Kileahane, and Doneen, and near Durrus the Coomkeen. In a north parallel range are the silver-lead mines of Keilwinogue, Rooska, and Gurty Clona, while in the Bantry district there is a lode, samples from which, assayed by Messrs. Richardson, of Swansea, yielded an extraordinary quantity of silver; this is not a silver-lead lode. In Whyddy Island there is a singular deposit of black schist, 10 or 12 ft. wide; it bears great similarity to Spanish chalk, and marks fine or large black lines on paper. All the carpenters of the locality use it instead of blacklead pencils; attempts have been made to utilise it as blacklead. The great copper zone comprising the Berehaven district extends eastward from that celebrated old copper mine through the Cah and Glannerrought Mountains to the south of the Roughy Valley, Kenmare, and in all this vast range of mountains, over 2000 ft. high, with water-power flowing from large lakes on their summit sufficient to drive any machinery, and containing great lodes of quartz and copper ore, it is, strange to say, unknown and undeveloped.

Next we have the rich metalliferous district of the Roughy Valley, extending east from Kenmare, with its lodes of copper ore and silver-lead, iron, blende, and arsenical pyrites occurring in the carboniferous limestone. The late Venerable Archbishop O'Sullivan, of Kenmare, writing over 20 years ago to the late Mr. Campbell, M.P., remarked as follows:—"Mines are there unquestionably; they are turning up in every direction, even in our very streets. Our mountains and the Roughy Valley were never placed there by our Creator without a purpose, and I cannot be persuaded but they are full of ore." Again, at the north side of the Kenmare river the Dunkerron Mountains extend westward to West Cove and Derrynane, and contain large lodes of quartz and yellow copper ore. These great lodes above West Cove are opposite the Berehaven Mines, and present more favourable indications at surface for copper ore than those celebrated old mines. There are miles of roofing slate and flag quarries standing idle, and situate close to safe harbours for shipment, while the debris from the works would fall into the sea, and incur no cost in the removal, or encroach on the land, causing surface damage. With the abundance of minerals cropping out in the mountains and valleys of West Cork and West Kerry, with unequalled natural advantages and facilities for carrying out extensive mining and quarrying operations, and also for the shipment of produce, yet, comparatively speaking, in this great mineral territory there is nothing done or doing. How is this?

In the *Mining Journal* of Sept. 11 there is an excellent article on this subject, and the important question is asked "Why are the Metallic Resources of Ireland not Developed?" I speak from long experience. It is not owing to the apathy or idleness of the working classes, for they are remarkably quiet, peaceable, civil, obliging, and anxious and willing to work. It is not from any danger to be apprehended to life or property. I have travelled the wildest and most remote districts of the South-West of Ireland during the famine, when the people were dying in thousands from starvation, and though carrying large sums of money about me, which was perfectly well known to the people, the thought of being molested never entered my mind. It is not owing to holidays; these are very few in the year, and do not in any way interfere with working miners; and further, during my experience I have had thousands of Irishmen, women, boys, and girls in my employment, and never received anything tending to an insult. It is not owing to the lords of the land demanding unreasonable terms for their mineral royalties, for only let it be ascertained that parties applying for mineral grants or leases are men of position, capital, and integrity, and they would be met on the most fair and liberal terms. It is often remarked that Irish landlords cannot expect to have their properties developed unless they either invest part of the capital required, or allow their names to be on the directory. It is, however, rather too much to

expect that Irish noblemen and gentlemen would allow their names to be associated with "doubtful characters"; but they are ready to meet men of known respectability, wealth, and position.

What, then, is the reason that English capital is not invested in the development of Irish mines? I think I can answer the question. During the last 30 years English capital, amounting to 200,000l., has been subscribed ostensibly with the view of working Irish mines, but a tithe of the amount never reached Ireland. What became of the lion's share is known only to promoters and other operators. The subscribers lost their money, as they supposed, in Irish mines, and hence, owing to so many heavy swindles, the indisposition of the English public to invest money in working Irish mines; for although what was lost was never invested in Irish mines, it was lost to the public, and owing to numerous swindles legitimate mining in Ireland has been brought into disrepute. I could state the name of a company, with a capital of 100,000l., for working mines in West Cork (this is irrespective of the 200,000l. alluded to before); the money was all spent, and not a gallon of water pumped out of the mine. Is it any wonder, therefore, that there is a prejudice against Irish mines, and are not these good reasons "Why the metallic minerals of Ireland are not developed?" But surely there are men to be found to carry out mining as honestly as any other commercial enterprise. It would be an easy matter to select 10 or 12 first-class virgin mines named in these papers; let these be properly and honestly worked under one *bona fide* company, and great and permanent success would be certain.

#### FOREIGN MINING AND METALLURGY.

Feebleness has been the prevailing characteristic of the Paris copper market. Chilean in bars, delivered at Havre, has made 87l. 10s.; ditto ordinary descriptions, 85l.; ditto in ingots, 89l.; English tough cake, 90l.; and pure Corocoro minerals, 87l. per ton. At Marseilles copper has continued quiet, and without much demand. The German copper markets have been generally quiet, and prices have not experienced any modification. There has been only a limited amount of business passing in tin at Paris, and prices have experienced scarcely any change. Banca, delivered at Havre or Paris, has made 95l.; Straits ditto, 91l.; and English, delivered at Havre or Rouen, 90l. per ton. There have been few variations in tin upon the Rotterdam market; some transactions have taken place in disposable Banca as well as in Banca for delivery at the approaching sale, at 53 fls.; at the last dates, the article was quoted at 52½ fls. to 52¾ fls.; sellers. Billiton has been offered at Rotterdam at 50½ fls.; there has not been much business doing upon these terms. There has been little doing in tin upon the German markets, and prices have been, to some extent, nominal. Little has been done in lead upon the Paris market; prices have remained almost unchanged. French lead, delivered at Paris, has made 23l. 8s.; Spanish, delivered at Havre, 23l. 4s.; and English, 23l. 4s. per ton. In Germany lead has slightly fallen with the advance of the season. Rough zinc has not varied in price upon the Paris market; rolled zinc has been well maintained at 34l. per ton. In Germany, rough zinc has been maintained with firmness.

The Iron Trade in Belgium still appears to have sustained a check of which it is difficult to foresee the termination. Never, perhaps, in the memory of the present generation has the state of affairs been less prosperous than it now is. There is a growing feeling apparently that the increasing introduction of steel rails in the room of iron rails has something to do with the present depression in the iron trade. The Belgian Minister of Public Works will proceed on the 3rd proximo with an adjudication for the renewal of a portion of the iron withdrawn from the State lines in 1875. It appears from the report of the directors of the Luxembourg Blast-Furnaces Company for the year ending June 30, 1875, that, notwithstanding the intense crisis through which metallurgical industry has been passing, the results obtained by the company during the 12 months were satisfactory. This result is attributable, to some extent, to the fact that a little more firmness was observable in the last financial year in the price of pig. To this favourable circumstance we may add another also of an encouraging character—that the blast-furnaces worked well last year, while great care was brought to bear upon the purchase of coke and minerals. The general expenses were spread over a very considerable production last year, and it is now expected that the cost of production will be still further reduced by the introduction of new apparatus on the Whitwell system. The profits realised in the financial year ending June 30, 1875, were 9701l., while the year ending June 30, 1874, resulted in a loss of 16,318l.

A revival in business is noticed in the Belgian coal basins. It is true that industrial coal is not disposed of very rapidly, but small stocks exist at the pits' mouths. The principal demand now prevails for coal for domestic purposes, as usually happens at this season of the year. Several of the Belgian collieries have increased their production, but others hesitate to do so in presence of difficulties which might arise in respect of wages. The working miners, however, see that it is to their interest to work at present rates rather than to lose some days in profitless strikes. A slight advance in prices is the natural consequence of the present state of affairs, as buyers see that they are likely rather to lose than to gain by waiting, at least so far as domestic qualities of coal are concerned. The La Haye Collieries Company will pay, Nov. 3, a second dividend for 1874-5 at the rate of 2l. per share.

It becomes every day more probable that the coal season which has just opened in France will not witness any very great variations in coal quotations. The price which is now being paid at Paris for good household coal is 2l. 8s. per ton. The prices current appear to be sufficiently remunerative for the coal trade, especially if they are accompanied by a regular and tolerably active demand, as appears likely, upon the whole, to be the case. Some attention is being devoted in the French industrial world to tramways. At present only eight French towns have obtained tramway concessions—Paris, Lille, Nancy, Havre, Versailles, Marseilles, Neice, and Dunkerque. There appears then to be considerable scope for the development of further tramway enterprise in France, but it is more an affair for the iron trade than for the coal trade. The Carmaux Mines Company will pay, Nov. 2, an interim dividend for 1875 at the rate of 1l. 4s. per share.

The depression in the French iron trade continues, and industrialists are beginning to discuss the causes of a dulness and stagnation which they regard as unjustifiable. The past week has not changed the general situation. Pig has, however, been rather firmer, and this may be regarded as an encouraging circumstance. Old rails have brought 4l. 4s. per ton. Pig is worth 2l. 6s. 6d. per ton in the Luxembourg, and 2l. 14s. 6d. per ton at Nancy. Quotations for iron have exhibited little or no variation. The concern known as the Forges et Chantiers de la Méditerranée has announced an interim dividend for 1875 at the rate of 16s. per share. The Mokla-el-Hadid Magnetic Iron Minerals Company will pay on Nov. 2 an interim dividend for 1875 at the rate of 16s. per share, 16l. paid-up, and 1l. per share 20l. paid-up.

#### THE RECOVERY IN THE VALUE OF QUICKSILVER

In an editorial, dated July 22, we gave complete statistics of quicksilver production, both abroad and in this country [see *Mining Journal* of Aug. 7], and some of the reasons why the metal had undergone such an important depreciation in value since the commencement of the year. The large production of California, and the low price at which the Rothschilds were offering Spanish quicksilver in the London market brought down the value from 11l. per flask during the latter part of July to 9l. a month later. This low quotation coincided with unexpected failure of the Bank of California at San Francisco. It was apprehended that many enterprises in California and Nevada would be embarrassed by that important failure, and being hampered in their operations cause a decreased use of quicksilver for an indefinite time in those localities. But these surmises soon proved to be ill-founded, and instead of a further decline the metal, immediately after the said failure, showed symptoms of recovery. Both speculators and consumers were reassured regarding the consequences of the bank failure on the Pacific, which proved to have been less ruinous to its own stockholders and the Pacific Coast generally than had been feared when first announced. Confidence in the immediate future of the metal, therefore, began to revive at the three leading points—London, New York, and San Francisco. At London a strong speculative undercurrent soon manifested itself, and faith in the metal began to recover. The movement was not fully understood on this



side at first, but as London continued to steadily advance, the truth soon became evident. The Rothschilds had just completed a contract with the Spanish Government for the leasing of the Almaden Mine production for a number of years to come, based on the previous low value. From having done all in their power during months to depress the value of the metal, they promptly became the most powerful supporters of it. Hence the rapid advance we have been witnessing since, which during the month of September carried quicksilver from 9s. per flask to 14s. 10s. A great stimulus had, however, been given to production last year by high prices, followed by important discoveries in Mexico. Now that the article has resumed an upward tendency, these sources of supply will be taken in hand with renewed vigor, and, unless consumption increases in proportion, a return to 20s. and upwards per flask does not seem as probable as when the house of Rothschild held the balance of supply under absolute control. But, however this may be, consumers at large have had a good opportunity for replenishing supplies at comparatively moderate figures. China, one of the most extensive users of quicksilver, has absorbed unusually large quantities, and so have other mining and manufacturing countries during this interval of depression of six months duration. At a greatly enhanced figure it is, therefore, more than likely that the demand may slacken for awhile, till consumers have reduced their stocks, and till they are able to form a more correct judgment as to the probable supply in the future.

One of the peculiarities connected with quicksilver is its rapid evaporation above a very low temperature, if exposed; hence the amount lost every month in the process of reducing the precious metal would seem, to the uninitiated, to be fabulous. In Washoe, Virginia, the great silver centre of Nevada, it amounts to about 2000 flasks of 75 lbs. per month, being 4-5ths of the monthly production of the State of California. It is estimated that 10,000 flasks per month could find a ready sale on the West Coast of America. It is, therefore, of great interest to the consumers of quicksilver that at the junction the Clayton Mines of California are to be taken in hand by a powerful English company. These mines are situated in San Benito and Merced counties, about 93 miles from San Francisco, being on the coast range, and in the same metalliferous belt as the famous New Almaden and New Idria Mines, lying about midway between the two. These mines were commenced in 1872; the one averages 6 per cent. of mercury, and a 7-ft. retort, running all last year, turned out about 45 flasks per month. It is now proposed to erect three 20-ton furnaces of improved construction, and assuming that the ore yields about 40 lbs. to the ton, and estimating the cost of mining and reducing at 1s. 6d., the profit would be nearly 60,000l. per annum, or 40 per cent. upon the entire capital of the company: every 1 per cent. extra of metal in the ore would add about 50,000l. to the net profits. The ore at Clayton likewise contains antimony as grey ore and oxide, in conjunction with the cinnabar, which would yield a large profit—say, 12s. to 15s. per ton, and from 300 to 400 tons per month could be placed. The production of Europe being limited, and under control of one powerful capitalist, the future of quicksilver, and to some extent, the property of silver mining, therefore mainly depends on the capacity of California to indefinitely increase its output. Hence the interest which attaches to any new sources of yield in that State.—*Iron Age* (New York), Oct. 14.

#### DEEP MINING IN COLORADO.

With a view to secure the more rapid development of the mineral resources of Colorado, a committee of mining experts was recently appointed by some of the heaviest mine operators in Central City to report upon the prospect of deep mining in that territory. The chief object was to form a company for working Mr. Buell's property, and to this the report largely referred. The committee included Messrs. A. N. Rogers, W. M. Rule, C. H. Briggs, R. Pearce, and D. Sullivan, and their report is an elaborate and interesting one, starting with the axiom that the staple industry of the territory is mining, and that upon its successful prosecution depends the growth and prosperity of its people. But for our mines, the committee remark, there would be little to keep us, and we should soon be without population or social existence. If in this new and isolated territory we see the rapid march of progress, the accumulating evidences of wealth, the permanent establishment of cities, the advent of railroads, and the various and fitting institutions of society, we must admit that this is due to the existence of our mines, and that this magnificent superstructure rests upon the solid base of our mineral deposits. It is true that Colorado has other and varied resources, made available by mining, but separated from this, the underlying and paramount industry of the country, they would have remained dormant and valueless. Wipe out the mines, and you would blight the fair prospects of this commonwealth in a day. Give them development and richness, and see how quickly you will stimulate every other industry in the land. Mining, then, is the foster-mother of all our successful undertakings. We trace its generous influence through every branch of industry—in every trade and business avocation. To promote mining is to build from the foundation, and to expand alike in all directions.

The Amador, the Eureka, the Comstock, Morro Velho, Dolocath, and a multitude of other mines, demonstrate the necessity for deep mining, and the committee contend that the experience of others justifies sanguine expectations as to the results of a similar trial of the veins of the section under consideration, supposing them to be true fissures. They explain that a true fissure in the sense applied, means one having defined walls and continuity in depth, and that here the structure of the country rock is such as not to permit of a reasonable doubt, for the reasons:—1. The gneissoid rock of which it is composed is the oldest sedimentary formation in the geological system, it being the foundation, none but igneous rock can underlie it.—2. Fissures can only be made by disturbance of the foundation from its bedding, and this must occur by upheaval, the result of pressure from beneath, or within the mass, exerting itself outward. It is evident then that a rupture must break through the whole mass from the bottom.—3. The rupture must occur on the line of easiest fracture, and if we can determine what agency has caused a weak point or plane, what feature of the rock will indicate this line, we shall have mastered much of the difficulty in the way of an intelligent verdict. Tell us what has caused a uniform and continuous fracture, cleaving its way through the interesting strata? What has occasioned a positive and definite cleavage along the margin of our veins, determining what we term wall, instead of leaving them ragged and irregular, as would be the case if the rock were broken by any agency of our device, and the rest is easily understood.

The committee find that everywhere throughout this gold bearing region in causing the broken surface of the country, and in studying the physical features which give it character, there can be observed the predominant and distinguishing feature of cleavage, splitting the rocks into fragments upon the surface, and seaming them with lines or planes of jointure beneath the surface. These are not accidental and capricious, as may at first be supposed. They have a very remarkable and uniform surface of fracture and parallelism of direction, their planes being vertical, and their strike ranging N.E. and S.W.—coincident with the direction of the lodes. They cut plumb through the strata, and in fossiliferous rock they cleave in twain any fossils which may lie in their way. Nothing intercepts their course.

Their history would be interesting. It is often, they say, been vainly attempted, but clothed in doubt and mystery as it is, it is needless for us to attempt to trace it. Suffice it to say, that this cleavage has produced this cleavage has extended over a vast area, and was powerful and uniform in its action, undeviating in its influence as the magnet, unvariable in results as the laws of crystallization. As we cannot limit its scope laterally from what we see, no more should we limit it vertically, for we may be equally sure of finding a treasure where we seek it. It is not a matter of importance to determine how the work was done, if it is done, and well done. In case the fissures continue in depth, whatever may have been the process of filling, if we reason upon the hypothesis that like causes produce like results, we can feel pretty well assured that in this case, as in every observed process of Nature, the work has not been abandoned when but half finished. With the top of the fissure filled, and with like geological conditions holding to the bottom, both logic and experience point to but one conclusion—that the bottom too must in like manner be filled.

One cannot, they say, imagine a possible contingency which would interfere with the work at one depth of the fissure more than another, except by a change of the enclosing rock running from one formation into another of different elements, and differing congenitally. This, it is known, sometimes occurs; but in this case it cannot happen, as there is no underlying rock of a different formation (except the casual accidents which sometimes occur by the protrusion of dykes of the igneous family) which can be encountered. We are to deal with rock of the same formation in nature to the very bottom; and, while the absence of surface disturbances will tend to better the condition of things, no change in the character and elements of the rock can take place to metamorphose or permanently impoverish the vein.

The geological conditions to be seen in the district in which Mr. Buell's property is situated are analogous to those found in almost all the important metalliferous districts in the world, and what years of experience has demonstrated elsewhere should have a paramount significance under like conditions there. The committee feel confident that the mines there are no exception to the rule. Fissure veins in Colorado are analogous to fissure veins in California, Nevada, Australia, Germany, Cornwall, and all the world. Like measures in the district reported upon will produce like results. The neglect of the mines is the tacit admission that they will not pay; still, they may never have had an honest trial, and in most cases we know that they have not been tried. Storage and failure, all the same, stand charged to the mines. If it is the fault of the mines, it is not because they have been worked, but the very reverse of it. What is now sought is to find the shortest road out of this condition of things, and it can only be done by strengthening the public confidence in both the value and enduring qualities of these lodes, proving them to be similar to other fissure veins in other sections of the world. This, they consider, can be done by submitting some one of their representative mines to the crucial test of a deep and fair exploration to a depth of not less than 1500 ft.

If, like Hayward, they vindicate the often repeated assumption that mines will hold out to that, and greater depth—or better still, prove them to be stronger and richer as they go downward—who can measure the immediate fruits of even one successful undertaking of this kind? It will make not only two, but many "blades of grass grow, where now there is but one," for to every mine which now is worked we have scores of good ones remaining idle; and for each of these which is put to work we shall start from its fountain the generous mother current, to strengthen the arms of industry, and quicken the pulse of enterprise. Forever waiting for "something to turn up," won't do. We have already had an exhaustive experience of this policy. Mines, and good ones, which could to-day have been 2000 ft. deep, and which could have thus assured the success of scores of others, equal in promise, have reached but one-fourth of that depth. They are even now standing idle, "waiting for something to turn up."

With regard to Mr. Buell's property, the committee say that as an investment there is much to recommend it. Considering the past record of the mine, the large extent of vein there is to work, and the very valuable improvements erected thereon, thus furnishing a valuable and extensive property in complete working shape. As to the terms of transfer, Mr. Buell offers one-quarter interest in the Leavitt lode, 1500 ft. in length. This property has yielded more gold than any

other in Gilpin county during the same period. The engines and boilers have been thoroughly overhauled during the past few weeks, and are now in splendid order, and of ample capacity to do the necessary hoisting and running of a pump at a depth of 3000 ft. The stamp-mill is equal to the best in this section of this territory, and has a crushing capacity of from six to eight cords per day of 24 hours. The mill and all machinery are almost new, have all the recent improved appliances for protecting the property against any accident by fire, &c. The hoisting machinery is the very best that Mr. Rule has seen in that country. He explained that the advantages of sinking on this lode over any other are manifold. The company investing here become quarter owners of the whole property, including the machinery. The latter alone must have cost over \$100,000 to place it in its present position. Should the shaft in running down 100 ft. open up a bunch of ore—such a one, for instance, as Mr. Mellor struck in this same shaft, which is by no means unlikely, it would be the best investment ever offered to this or any other community.

#### MINING IN AUSTRALIA—MONTHLY SUMMARY.

**THE ALMA GOLD MINE.**—The secretary of this north-eastern mineral property has received a cake of smelted gold, weighing 117 ozs. 11 dwts., as the latest result from the company's battery. Subsequently a telegram announced that 300 ozs. of gold had arrived from the mine at the Burra. We are informed that the yield, which when smelted gave 287 ozs. 2 dwts. 4 grs. was obtained from 130 tons of stone, which quantity was crushed in 9½ days. The result is considered most encouraging. Since the end of May, when the first lot of gold was received from the property, 746 ozs. 12 dwts. 19 grs. have been sent to Adelaide. Mr. T. D. Jackson, the managing director, on Aug. 28, reported:—"The mine is looking well, and there is in view a good prospect of future crushing."

**THE MOONTA.**—A discovery has been made at the Moonta Mines which probably surpasses in value any that has hitherto taken place in that magnificent property. We have mentioned from time to time that a cross-cut was in course of extension westward of Taylor's shaft, at the depth of 100 fms. This work was begun about three years ago, with the object of exploring the ground for ore. It was anticipated by Captain Hancock that at some considerable distance Duncan's lode would be intersected, and there was also a possibility of making other discoveries. As a speculative undertaking in mining it was a most important and enterprising project. Slowly and laboriously the work was prosecuted with few interruptions, and at length at a distance of 50 fms. from Taylor's lode the company were rewarded by the discovery of a splendid course of ore. The lode is about 5 feet wide, 3 feet of which is composed of solid yellow ore. The average value of the lode in both drives, north and south, is 6 tons of 18 per cent. ore per fathom. When it is considered that a lode of this size and richness has been cut at a depth of 100 fathoms that it will in all probability be found productive to within a short distance of the surface, and that its productiveness will be maintained for a long way northwards and southwards, as well as to an indefinite depth, it will be seen that the discovery is one of incalculable value. In fact it will constitute the mine of itself, the workings of which will afford employment to a large number of miners for many a year to come. Whether the new lode is a continuation of Duncan's, or one entirely distinct remains to be proved. The total cost of driving the cross-cut was about 1500l. A quantity of ore from the lode has already been brought to the surface, where it is very noticeable for its purity and beauty of appearance. Another discovery of considerable importance has been made in the mine, at a spot a few hundred yards from the township. In a shaft 4 fms. deep, and south of Hall's shaft, there has been cut a rich lode of black ore, about 8 in. wide. It is supposed by some that this is a continuation of Hall's lode, while others are of opinion that it is an entirely new lode. At Ferguson's shaft large piles of ore are being sent to grass, and the general yield of the lode is fully maintained. Near Hancock's jiggling-machine a considerable area of ground is in course of excavation in the sandhill for the purpose of forming dressing-floors. The work is being done in a somewhat novel method. Temporary lines of rail are laid in the excavation, and continued over the hill to its opposite side. The earth, which is dug up by a gang of men at so much per yard, is shovelled at once into tram-wagons, which are drawn up the incline by a wire rope attached to winding-gear connected with the dressing engine, and propelled to the other side of the hill, where the wagons are emptied. In this way the earth is removed with the utmost economy and dispatch. At Hughes's shaft, sinking below the 100, the lode is large, composed of yellow ore and quartz. The lode in the drive of the 100 is not very large at present. Preparations are making at Mine's shaft to resume sinking the south shaft below the 30. At the tribute pit a little ore is being obtained, and at the back of the 20 the yield is 3 tons of 22 per cent. ore per fathom.

**THE YELTA.**—The pumping machinery in the Tank shaft began working on Tuesday, the pump being worked by a wire rope in connection with the old engine. Everything is in excellent working order, and it is expected that the water will be forced by the end of the week. The water in the shaft was about 5 fms. deep, the surface being about 28 fms. from the top of the shaft. The unwinding of this shaft will drain a long run of the lode, and will also exhaust the water from No. 7 and Wigley's shaft. In the main workings of the mine there is no change to notice. In Cowling's shaft men are driving at the 24, where the lode is producing 3 tons of 16 per cent. ore per fathom. Operations have been resumed at the trial shaft.

**THE SLIDING ROCK.**—On Aug. 21 a new engine was started at this mine with appropriate ceremony. The mine is now being worked with renewed activity, and of its prospects the manager reported as follows on Aug. 30:—"The new puddling machine were started without any interruption, and the alteration having been made. In opening upon the clay they have exceeded my expectations by the quick manner in which they reduced it. I find that they not only puddle the clay but will answer to size the copper-litter. Reducing the clay into slimes, they throw the fine clay, fine copper, and fine slimes all out together, and leave the rough copper in the machine; and as this had before to be done by hand it can be treated at the discharge of the puddling machines by appliances which are now being made which will save the finest particles of copper that may escape the machines. The winding gear is working remarkably well. Twelve men will start to sink to-day, and I expect to reach the 35 in a fortnight, when drives will be opened north and south on the level of rubble clay. I find it will take double truck lines in the drives below to keep the machinery in full work, and I think it will be to the advantage of the company to open the 35 fms. levels with double truck lines, as the 25 fms. levels are only adapted and driven to admit one truck line, which would only keep the machinery half going. I think it will be much better to carry the steps up from the 35 to the 15 fms. levels, allowing all the clay to fall to the 35 fms. level."—*South Australian Register*.

**COAL IN AUSTRALIA.**—The correspondent of the *Times*, writing from Melbourne (Sept. 7), says:—"In June, 1874, I sent you an account of a Victorian coal mine, at Westernport, from which we have received several reports. Several cargoes of coal had been shipped to the Melbourne market, burnt well, and, as all were sold, paid well. The enterprising proprietors of the colliery, who had spent large sums on a tramway and jetty, were congratulated on their success, and we heard little more of them till three months ago, when they invited a large party to visit the mine, in the hope, as it afterwards appeared, of obtaining additional capital for extended operations. The pleasure excursion did not lead to business, and the proprietors have lately admitted that their works must be stopped unless extraneous assistance be given in one shape or another, and as is usual in such cases, the Government has been asked to make a railway to a point on the coast near the mine, and promised plenty of profitable freight from the colliery, and the country through which the line passes. The Government does not see its way to acceding to this request, but, anxious to propitiate the proprietors, has promised thoroughly to explore their mine at the public expense. Years ago our own geologists, as well as the coal viewer of New South Wales (who was called in as a practical man to refute scientific theories), told us distinctly that no payable coal was to be found in the district, and now that the assurance has been verified by the disastrous experience of the company, further expenditure in ascertaining the character of the deposit seems unjustifiable."

#### AUSTRALIAN MINES.

**YORKE PENINSULA.**—The directors have advised from the Committee of Inspection at Adelaide, dated Sept. 5, with reports from the Kurilla Mine to the 6th. Captain Anthony reports:—"On the Kurilla lode Hall's shaft is drained to the 35, and the shaft is put into order for continuing the 35 cast. Nothing has been done towards driving the 25 cast since my last, but I hope to resume driving in a month from date. Six men are running up the rise against the hauling shaft, which will be holed in a fortnight. The 15 cast is driven to and past B trial shaft, which I deepened from the cross-cut to the 15. The lode has produced ore for the last 25 fms. without intermission, and still continues to do so. The following tribute works are in progress:—In the back of the 15, between the B and hauling shafts, two pitches are set to four men, at 8s. in 1l., and one in the Prospector's shaft, to four men, at 7s. In the back of the 25 the pitch is divided into two, each set to two men at 10s. I have marked out a pitch under the wide lode (bottom of the 15) for four men, at 6s., but I have not yet set it. Since my last I have holed the 10 fms. driven west, on Morphet's lode (25 fms. north of the Kurilla lode), to No. 4 trial pit, and have resumed driving. The lode is 3 ft. wide, and opening tribute ground of (say) 8s. to 10s. in 1l. This drive is now 45 fms. long, with more or less ore throughout, and showing unmistakable indications of becoming a good lode in depth. Means should now be considered for working this lode below the water-line. Above the 10 fms. level 100 tons of ore have been raised, and no doubt another 50 tons remain in the lode. Besides this the Devon Consols people are raising a considerable quantity of ore on tribute, as near as it is prudent to come towards our boundary. I may say about 4 fms. from our eastern boundary, on the other side of it, a slide is met with dipping into our section, and this no doubt will carry the ore into our ground. Two men are working a tribute pitch at 8s., and there is another pitch open at 10s." At a point about 10 fms. east of Hall's, on the Kurilla lode, and 10 fms. south of that lode, a new lode, now named Anthony's lode, has been discovered, and sunk upon 4 fms. The underlay is towards the north, like the Kurilla and Morphet's lodes. Captain Anthony states:—"It is my intention to sink 5 fms. and then drive east, and a hopeful finding ore in it." He is also continuing a cross-cut south from the 15 on the Kurilla lode at point much further east, to cut Anthony's lode, and which can be done in about 7 fms. driving. He states:—"There are 26 men on pitwork and 14 on tribute, at an average of 8s. 3d. in 1l., and I hope to set four at 6s., and two at 10s. during the present week. About 70 tons of ore are now at the smelting works, the weighing of which was delayed a week by heavy rains, and there are about 70 tons in the course of dressing."

**SCOTTISH AUSTRALIAN.**—The directors have advised from Sydney, dated Sept. 3, with reports from the Lambton Colliery to Aug. 31. The sales of coal for the month of August amounted to 16,039 tons.

**ANGLO-AUSTRALIAN (Gold).**—Capt. Raisbeck writes, Sept. 6:—"Prospecting Shaft: We have had six men breaking stone in the stopes, and have broken and crushed 170 tons; result, 27 ozs. 13 dwts. of retorted gold. There is very little alteration in the character of the stone. I do not think it will extend east, but should it splice and make east, as it did where the tributors worked, we should have twelve months' work in sight. If it does not we shall soon work out the stone we are now working upon. We have during the month secured with timber 100 ft. of the north drive. We have crushed the 8 tons of stone taken from the rise in the 320 ft. cross-cut; result, 10 dwts. of gold. I am very much disappointed in not being able to prospect this part of the mine. The work we have done is no proof of the value of the ground, as we have merely touched the strata of the ground we intended to prospect, and I doubt if we shall be in a position to prosecute the work from our returns."

**AUSTRALIAN CENTRAL (Gold).**—Mr. Gill, Sept. 7: Since last report I have had 18 men engaged in opening out. The main drive east and west has been extended upwards of 240 ft. in all. I am continuing the main drive north through a heavy bar of reef, which is apparently dipping, with the prospect of deep ground beyond; if so, it will be another gutter. Several lateral drives have also been put in to more effectually drain the ground. The country west appears to be still

deepening, but progress is slow in that direction, owing to the heavy bars of reef requiring to be cut through in carrying the main level, and also to the heavy bed of water to contend against. The reef bottom is far more uneven and irregular than other portions of the mine yet worked, and entails a large quantity of dead work. The washdirt still continues very heavy, and is certainly the best-looking dirt we have yet seen in the mine; its value can be judged only by the gold that has been raised since the commencement of the main level. Though 18 men have been at work, not more than half that number may be considered to be fully employed in raising gold, the other half on dead work. The yield—about 50 ozs. of clean gold—is a most satisfactory result of the value of the ground. I do not fancy our shareholders will have much cause to complain if the future only equals the present value. I am still undecided as to matters underground, but am still of the opinion that we are at the junction of two or more gutters, my convictions being strengthened by the appearance of the washdirt and the deepening of the ground west, as well as north. I am so satisfied on this point that were I financially in a position to do so, instead of being crippled as I am at present, I would defer blocking operations for some months, and thoroughly test the country on the north-east and west, in which directions I feel assured we have a large field of paying washdirt to operate upon. Another month's work in opening out will go far in placing matters on a certain footing as regards the western ground.

**Capt. Anguin, Sept. 7:** Since we struck the washdirt the west and east main drive has been extended 240 ft.; last week the reef dipped 3 ft. under bottom of level; we were compelled to drive over the dip in "slepe" pieces for 34 fms. good wash underfoot. The reef is now 5 ft. in face of drive. Three block drives have been opened in main drive west—one drive north and two south. North drive has reefed at 25 ft.; south drive at 54 ft., and not yet reefed. From present appearances there is another gutter to the north, which will be proved in a week or two. I have to report a breakage which occurred last Monday morning. The blow-off pipe broke close to the boiler, and caused a delay of three days and considerable expense. I would call your attention to the necessity of having a little spare capital to fall back upon in case of accidents.

**ENGLISH AND AUSTRALIAN (Copper).**—The directors have received advice from their manager, dated Port Adelaide, Sept. 9: With reference to the stock of the manager writes:—"We are now fully supplied—in fact, rather overstocked." All the furnaces, both at Port Adelaide and Newcastle, were in full work. The copper shipped since date of last advice was 297 tons.

**PORT PHILLIP AND COLONIAL (Gold).**—Sept. 4: Quantity of quartz crushed for the four weeks ending Aug. 11, 3603 tons; pyrites treated, 18 tons; total gold obtained, 1086 ozs. 13 dwts., or an average per ton of 6 dwts. ½ grs.—Receipts, 4369l. 11s.; payments, 3008l. 8s.; profit, 1361l. 3s., added to which was last month's balance of 1037l. 8s. 4d., making an available balance of 2398l. 11s. 4d. The amount divided between the two companies was 1200l., the Port Phillip Company's proportion of which is 780l. The balance of 1198l. 11s. 4d. was carried forward next month's account. Remittance, 750l.

**Telegram, dated Melbourne, Oct. 15:** Month ending Oct. 6: Yield per ton, 5 dwts. 9 grs.—Profit, 630l.; remittance, 650l. Commenced No. 11 level.

#### SOUTH AUSTRALIA—MINING SUMMARY.

**KURILLA:** At this mine the usual activity prevails, and the good prospects of future success do not diminish, but rather improve. Indeed, no doubt can now exist of the importance of the mine to the company at home and to the whole community here—that to arrive at a profitable condition is only a matter of time and labour. The success of this mine goes to show what might be done in this wonderful mining district—10 months ago it was the Kurilla lode discovered many years ago, and now it is the Kurilla, Morphet's, and Anthony's lodes, and all bearing ore. It does not seem to be generally known that Capt. Anthony has accepted what is, on this Peninsula, an entirely new mode of conducting mine business. The long established monthly survey is not observed, but the bargains are set privately, either extending from the first to the last of the calendar month, or in long bargains of so many fathoms to drive or sink, as the case may be. In this, much time is saved by avoiding periodical stoppages, such as occur under the old system. And then he has got rid of the vexatious mine doctor question, by refusing to collect the fees or in any way interfere either with the selection of medical officers, or between them and the men. He has also ignored the fact that the mine authorities should deduct a portion of the men's earnings to form a sick fund, making every mining company a benefit society. But in place of these there are a number among the men, independently of the mine, by which all the benefits are secured to them, besides the satisfaction of being allowed to conduct their own affairs. A secretary and a treasurer have been appointed to receive the doctor and club fees, and pay the moneys over to the medical officer for his services, and to the men when due. The only power exercised by the captain is to prevent arbitrary measures being adopted by the executive. Thus every man is free to pay, or not to pay, doctor and club fees and to select his own doctor. Capt. Anthony tells us that this plan works well—that the men seem pleased, and he has no trouble.—*Wallaroo Times*, Sept. 8.

**GOLD.**—The yield of gold in the Northern Territory continues to be good, in proportion to the number of miners employed, and the steamer now on her way to Port Darwin will take from there about 2300 ozs. of gold. A fresh reef, showing gold-bearing stone, has been discovered away from all other diggings. In South Australia proper the best auriferous reports are from the Waukaranga district, where the Alma Mine has given 287 ozs. of gold as the result of 9½ days crushing. This was from 120 tons of stone, and made about 750 ozs. since the battery commenced work. The Lady Alice has not been yielding so well, and shares have been affected in value, but persons who best understand the mine, assert it is not falling off at all, but that the small returns arise from the fact that the men have been passing some poor stuff through the machine instead of throwing it away, and when this is disposed of good ground will be again worked. In copper the principal item of news is the magnificent discovery of ore in the Moonta, eclipsing, it is said, any find hitherto made in that splendid property. The new lode is 5 feet wide, 3 ft. of which is solid yellow ore, the average value being 6 tons of 18 per cent. ore per fathom. This lode is cut at 100 fms., and it is believed it will be productive to within a short distance of the surface. Other parts of the mine are also turning out large quantities of ore. Reports from the Devon Consols are very good, and the Yelta is looking well and yielding largely. There is not much change in the Hamley and Paramatta. Large quantities of ore are on the floors or being shipped at the old Wallaroo Mine. The Mid-Moonta and the Kurilla present a promising appearance, and on smaller mines operations are being pushed forward vigorously.

The House and the country are eagerly looking forward to the introduction of the Railway Bill, which is to authorise the borrowing of over two millions for railways and other great public works. There is no doubt that we can safely borrow this amount, because our public debt is small compared with that of the other colonies, and there is owing to the Government for land purchased on credit, realisable during the next six years, over two millions sterling, most of which it is confidently expected will be paid. There is every reason to believe that the sales of land during the next few years will go on according to the same rate of progress. The Survey Department is in active operation, and large tracts of agricultural land are being surveyed with unexampled rapidity.

**EXPORTS OF COPPER FOR LONDON.**—The Bundaler, 5796 cakes, 3281 ingots; the Harold Brothers, 1340 cakes, 4860 ingots; the Beltana, 4383 cakes; the Crownthorpe, 50 tons of copper—all by the proprietors of the Wallaroo mines and smelt works.

**RAILWAYS.**—The length of railways proposed to be constructed by the Government is 529 miles, and the estimated cost is 1,900,000l. At a meeting held at Clare a resolution has been carried affirming the desirability of constructing a railway from the Burra line to Clare. A railway from Moonta to Ardrossan, on Yorke's Peninsula, is proposed. The Government have been recommended by a deputation to purchase the private railway on Yorke's Peninsula, and to construct a line to the north-east, from Kadina, to open up agricultural land.

**TELEGRAPHS.**—Since the introduction of telegraphy in the Australian colonies, about 19 years ago, 25,124 miles of telegraph lines have been constructed, the cost being 1,654,901l., and about 4000 miles of wire are now in the course of erection. South Australia has expended 540,000l. on 3000 miles of wire, and in the colony there are 103 stations. The Wheatstone automatic system of telegraphy has been introduced into this colony by Mr. E. C. Cracknell, Superintendent of Telegraphs, New South Wales.

We hear good reports from the immense agricultural country in the North. A greatly increased area of land is under cultivation, and should all go on well we shall have a greater surplus of wheat for export than we have ever had. The interests of the colony are all in a prosperous state, and the prospect is a very hopeful one. The copper mining interest is good, and the sheep-shearing, which has just commenced, promises to result in an abundant clip.—*South Australian Advertiser*, Sept. 9.

**MINING IN NEW SOUTH WALES.**—Among the new discoveries reported by the recent advice may be noticed that alluvial gold has been obtained at Tamar Springs, in the Tamworth district. The prospectors are now sinking for a heavier run of gold. There is also a reported discovery of gold at Carcoar, and a splendid specimen of quartz, impregnated with gold, has proved a great attraction; it is 9 in. by between 5 in. and 6 in. in dimensions, and is reckoned to contain about 100l. worth of gold. It was raised from the Prince of Wales claim, on Burnt Yards Hill, about 11 miles from the village of Carcoar. The news from other districts is also encouraging.

**SLATE PAVEMENTS.**—The object of the invention of Mr. R. G. Elwes, of Westminster Chambers, is to prevent slippiness on, and allow water to run off from, the surface of a slate paving, by grooving the slabs of which it is composed, in such a manner as to give a good foothold and provide channels for the escape of water from the surface, thereby adapting slate to the purposes of paving and similar uses.

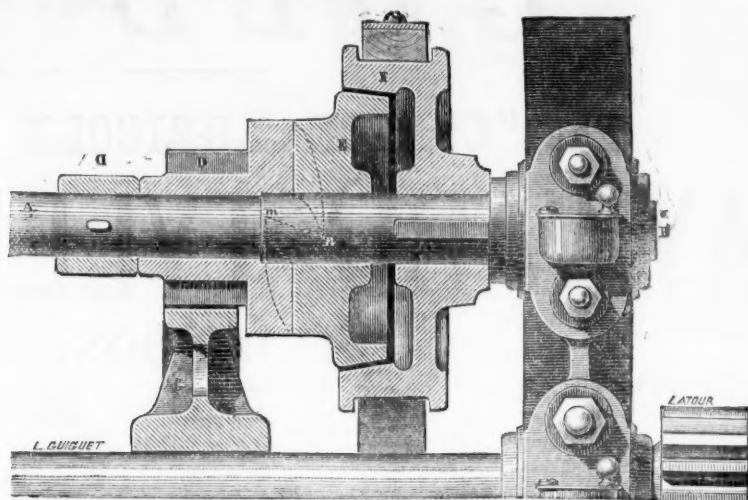
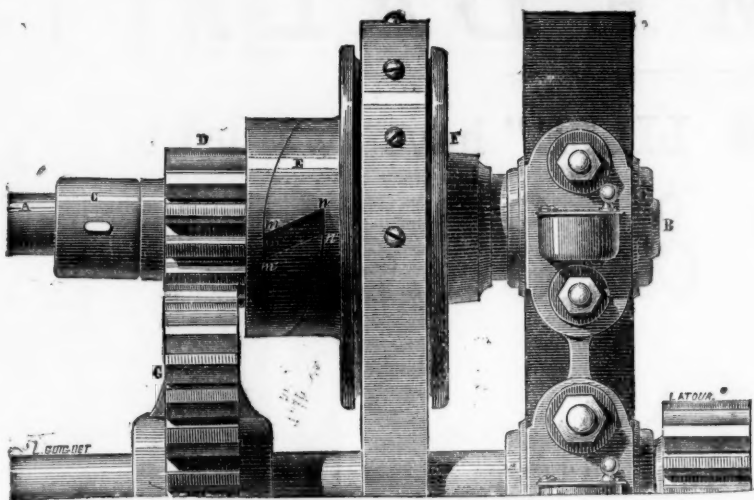
**MACHINE CUTTERS.**—Mr. J. LYNAM, of Manchester, has patented an improved combination of two metals, or a metal and an ore, to be used in the manufacture of cutters employed in machines for planing, turning, boring, and surfacing metals, and for all descriptions of machine tools. The invention relates to cutters used in machines for planing, turning, boring, and surfacing metals, and for all descriptions of machine tools; and consists in melting and mixing together in a molten state grey cast iron and tungsten, or grey cast iron and tungsten of the proportions the grey cast iron and tungsten being about 9 lbs. of iron to about 1 oz. of tungsten, and for the grey cast iron and tungsten of iron the proportion is about 9 lbs. of iron to about 2 ozs. of tungsten of iron. The iron and tungsten, or the iron and tungsten of iron, are melted and combined together in crucibles heated in the ordinary manner, and when the substances are properly compounded or combined the mixture is run into ordinary cast-iron chills, the interiors of which are made of the required shape of the cutters or cutting tools.

**VENTILATING MINERS.**—The invention of Messrs. KNOTT and RUD, of Wigan, consists in placing the wings of ventilating fans at an angle to the axis instead of parallel thereto as now usual, also in making the casing of such fans of cast or wrought iron instead of brickwork, also in varying the discharge orifice by means of a pair of plates hinged together and moved to and fro in the flue, also in the use of one or more stationary plates that are put into the flue at various distances from the sides to reduce the discharge orifice, also in driving the said fan by means of steam-engines set diagonally on the frame supporting the fan shaft.

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# AUTOMATIC CRANE BRAKE.



AUTOMATIC CRANE BRAKE.

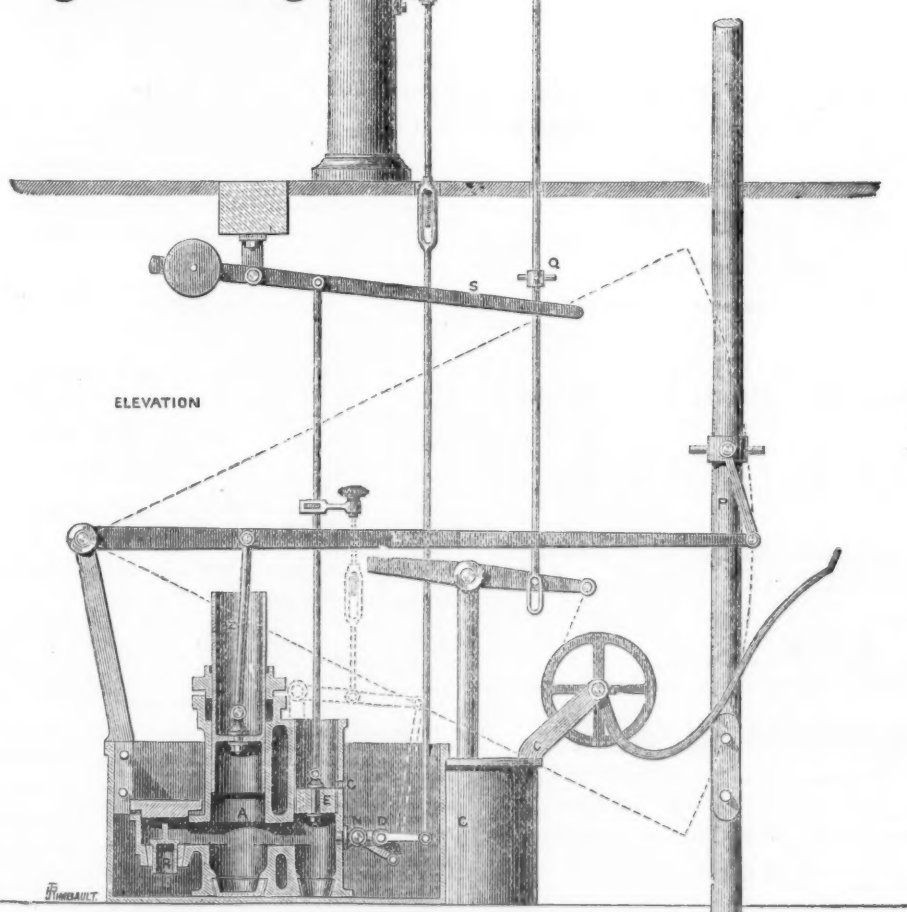
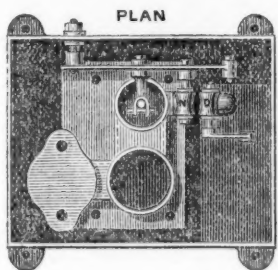
The ratchet-wheel generally used with lifting apparatuses, in order to prevent the descent of the load upon the men letting go of the crank handles, is very simple it must be admitted, but at the same time it offers serious inconveniences in practice, sometimes resulting in lamentable accident, and even loss of life. To remove these objections Mr. G. Bourgoignon, of Paris, has designed an improved automatic brake, which is now being introduced into this country by Messrs. BALL and CO., of New Bridge-street, which he states will render all accidents of the class mentioned practically impossible. The system is, of course, applicable to all descriptions of lifting apparatus. In the crane represented the crank-axle is so arranged that two different speeds can be given to the load, and so that the power can be taken off so as to lower the load without the handles turning. In the above engravings Fig. 1 represents an elevation, and Fig. 2 a vertical section of the new brake. A pinion, D, gearing with the wheel, G, carries on one of its lateral faces two semi-circular helices, similar to those employed in friction cone brakes; it turns dead on the shaft, AB. Secondly, there is a male friction cone, E, which also carries on its lateral face two semi-cir-

cular helices, which exactly take into those on the pinion, D; it likewise turns dead on the shaft, AB. A brake-pulley, F, is firmly fixed to the shaft, AB, upon which an ordinary brake-band operates. The crown of this pulley is bored out on the inside, so as to give a conical surface exactly corresponding to that of the male friction cone, E, so that this pulley really forms the female cone. Lastly, there is a ring, C, fixed on the shaft, AB, and in contact with the pinion, D. The brake, F, is automatic—that is to say, that towards the extremity of its lever there is attached a counterpoise, which causes the band constantly to grip, and keep both the brake and the shaft, AB, fixed. The helices of the pinion D, and of the male cone, E, terminate by a plane face, *mn*, which present with regard to the axis of the shaft an inclination of about one-fifth.

When the crank handles are turned in order to lift the load the plane face, *mn*, of the helices of the pinion D are supported on the face *m'n'* of the male cone, E, which is thus moved along. These two pieces turn freely on the shaft, AB, which is now fixed by the automatic brake, F. The helices are then disposed as shown in Fig. 1. As soon as the lifting of the load ceases and the crank handles commence to turn the reverse way the helices of the pinion, D, act on those of the male cone, E, and this cone is gradually pushed back until it becomes locked in the female cone formed by the brake, F.

This being kept fixed, as already mentioned, there is produced between the two cones a grip resulting from the resistance opposed by the fixed ring, C, which grip suffices to support the load, and the handles may then be released without the load descending. Practice has shown that for a helix the face of which is 1 decimetre it is necessary to arrange the apparatus so that the horizontal movement of the male cone shall not exceed 5 mm. When the load is to be lowered it is simply necessary to raise gradually the brake lever the pulley, F, not being then held tight enough by the grip of the band, is carried round by the male cone, E, and itself carries round the shaft, AB, which turns in its bearings, and all goes on as if the pinion, D, and the cone, E, were fixed on the shaft. The descent can be regulated with the greatest facility by taking more or less pressure off the lever, and the fall is altogether stopped as soon as the lever is released. It need not be mentioned that if it be desired to prevent the turning of the handles whilst the load descends the crank handle shaft must be thrown out of gear as usual. It is considered that the brake, which has already been adopted by all the French railways, and borne the test of three years experience, will prove equally valuable for all kinds of cranes, lifts, &c., and that its great simplicity and efficiency will ensure its extensive adoption in this country.

## HUSBAND'S SAFETY GOVERNOR FOR CORNISH PUMPING ENGINES.



HUSBAND'S SAFETY GOVERNOR FOR CORNISH PUMPING-ENGINES.

Breakage of the main rods in the Cornish pumping-engines, and the general smash attendant on such breakages, is often assigned as a sufficient reason for discarding the use of this most economical machine. The safety-governor, as illustrated below, is designed to prevent the possibility of such accidents, and inasmuch as the whole apparatus is so simple, effective, and inexpensive, and considerably enhances the safety of the engine, no doubt it will become extensively applied. In the Cornish pumping-engine, used for drainage of deep mines, the most serious accidents arise from the breaking of main-rods, which naturally takes place during the time that the piston is taking steam, the piston being suddenly relieved of its load. Considerable damage is the result, a sudden decrease of load

on the engine from any cause whatever endangers its safety, and the spring beams must suffer if the engineman is not at his post. What the engineer would do to prevent such a result would be to throw up the equilibrium catch immediately the engine evinces a tendency to what is technically called "coming indoors" too fast, but the engineer cannot always be prepared for such emergencies, especially where he has a multiplicity of duties to attend to, as in the mines of Cornwall. Nor could he, if stationed at the handles, be always certain in throwing up the catch in time. This safety governor is designed to act simultaneously with the engine, and will be understood by reference to the engraving.

The plunger T makes its upstroke with the upstroke of the engine, and draws its water through the valve B, forming part of the ordinary cataract cistern. The water so pumped is discharged into the same cistern through the regulating cock D, which is adjusted by means of a rod, M, from the engine floor. If the engine increases its

speed above the normal rate of working from any cause whatever, the water is throttled in its discharge through the cock D, and a pressure is thus imposed upon the piston E, tending to raise it; as the piston E rises the lever S comes in contact with the catch Q, and thereby lifts the equilibrium catch B; to increase the effectiveness an additional cock N is provided, which closes as the piston E rises, thus increasing the force imposed on the said piston.

**IMPROVED TUNNELLING MACHINE.**—Mr. O. B. DOWD, of New York, has patented a machine which is designed mainly for tunnelling under the beds of rivers, where the material is soft and liable to cave and crush in; and the invention consists of a cylindrical case, with a head at the front end, out of which projects at the centre a revolving shaft carrying a cutting and scraping arm, which breaks and cuts down the earth, and forces it into the case through an opening at the bottom of the head. The shaft carrying the arm is hollow, and the arm is also hollow, and suitably perforated to allow of softening the earth with water, by forcing the water out through the shaft. There is a pipe discharging through the head at the top for watering the earth in that way to render it sufficiently fluid to be forced out through pipes. In the bottom of the case is an oblique opening, through which a large tube may be projected to sink a hole below the line of the tunnel by working through the tube to sink a boulder or other solid object out of the case. The case is to be forced along as fast as the earth is removed in advance of it, and it is to be followed up by the wall of the tunnel, which is to be built along at the same time as the work progresses, keeping the rear open end packed with the wall of the tunnel, and so as to exclude water and mud or silt from settling into the case. There is a pipe for discharging the silt, &c., by hydraulic pressure.

**MOTIVE POWER.**—Mr. H. B. BARLOW, of Manchester, has patented (for Emil Deck, of Vienna) some improvements in engines for obtaining motive power and for pumping, partly applicable for converting a rotary motion into a rectilinear to-and-fro motion, and vice versa. This improved motive power engine consists of four cylinders, placed at right angles to each other, and at equal distances from a central double crank shaft; the pistons of these four cylinders are connected to two rods, and each rod is jointed to one of the cranks of the double crank shaft. In converting a rotary motion into a rectilinear to-and-fro motion, and vice versa, a crank pin is fixed on a small disc at the end of a shaft; this crank pin fits in a hole in a rod capable of sliding to-and-fro in bearings in a larger disc fixed on a second shaft. As the first shaft rotates it causes the second shaft to rotate at half the speed of the first.

**PREVENTING RAILWAY ACCIDENTS FROM INATTENTION TO SIGNALS.**—The features of novelty which constitute the invention of Messrs. CRICHTON and CRAIG, of Coupar Angus, are the attachment to the engine cab or other convenient place of a vertical tube having a rod sliding therein carrying at its lower end a wooden staff or baton, which rests on a bracket placed at a convenient height above the rails. This said rod is connected at its upper end by means of articulated levers to the whistle. Failure to attend to the ordinary signal when at danger causes the staff or baton to strike against the arm of a bell-crank placed at the side of the line, and being broken by the blow at a point specially made weak, the rod carrying it falls and causes the whistle to sound, thus giving warning of danger. The staff or baton is held in the lower end of the rod by a spring or other clasp, and after fracture the broken portion may be removed and a fresh staff or baton entered by the driver. The driver will prevent the fracture of the staff or baton in passing within a danger signal by raising the rod which carries it to a height sufficient to clear the arm of the bell-crank, and in so doing the whistle is sounded, and notice of his arrival at the signal is given.

**PREVENTING COLLISIONS AT SEA.**—The invention of Mr. J. Mc. F. GRAY, Chief Examiner of Engineers, Marine Department, Board of Trade, relates to apparatus for mechanically solving problems in connection with the rule of the road at sea, which is constructed with discs or dials and eight arms or pointers, the discs or dials being marked or cut in such manner that when one of the said discs or dials is turned to the position corresponding to the direction of the wind in relation to the vessel (A) whereon the apparatus is being used, and another disc or dial is turned to the position corresponding to the direction in which another ship (B) is seen from (A); the apparatus will then show, according to any rule of the road for which it is constructed, which of the vessels (A) or (B) has to keep clear of the other; and at the same time will indicate the courses possible for either vessel, or it may be for both vessels, as limited by the direction of the wind and by the light screens; in other words, in the latter case the apparatus will show all that can be deduced from these limitations on board (A) as to the courses possible to (B), and on board (B) as to the courses possible to (A). A movable compass card or disc may be combined with the apparatus to indicate the directions in relation to the cardinal points when that is required. In some forms of the apparatus the sight arm is prolonged and carries at its outer extremity an outline hull to represent one of the vessels.

**MOTIVE POWER AND MARINE PROPULSION.**—The improvements in constructing and propelling ships and yachts invented by Mr. E. H. C. MOWAT, of Fineshade, Wansford, consist in attaching cylindrical conical outriggers at some distance beyond the sides of the hulls of very long narrow ships drawing little water, so as to prevent their rolling; in having six rudders and keels easily movable; in constructing the hulls so as to prevent all possibility of collapsing at their centres; in having paddle wheels of a greater than ordinary diameter placed so as to work during bad weather in comparatively speaking smooth water; in using balancing frames for coaches, and attaining by such means immense speed, with little or no motion, great facility for turning, increased safety, and reducing the tendency to sea sickness to a minimum. The same gentleman, in conjunction with Messrs. CREASY and TULLY, of Lambeth and Bow, has patented an invention which relates to a novel and simple apparatus or machine for obtaining motive power from the pressure of water, oil, air, steam, gas, or other fluid. The said invention is carried into practice by the combination of force pumps, and by preference a hydraulic ram or rams, for obtaining the pressure of the steam, gas, or fluid, and a toothed wheel or wheels, whereby this pressure is utilised as motive power.

**ELECTRO-MAGNETIC ENGINE.**—An improved motor of this class which could, no doubt, be advantageously employed when only a small amount of power is required has been invented by Mr. C. A. HUSSEY, of New York. By it the induction currents of the magnets and sparks of the commutator are entirely avoided, and a more perfect utilisation of the battery current is produced. The essential features are the stationary magnets having radial arms with T-shaped ends, arranged in alternating position, so that the pole ends of one face the intermediate space between the pole ends of the other; the outer stationary magnets having widening pole ends of T shape at right angles to the arms; the central revolving magnet provided with widening pole ends of double T-shape at right angles to the radial arms of the same, and the stationary and revolving magnets having radial arms and widening pole ends whose face width is somewhat larger than the distance between two adjoining pole extremities, so as to lap on the pole ends across the intermediate space.



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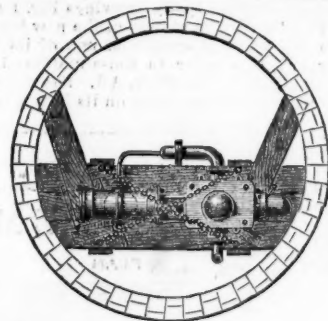
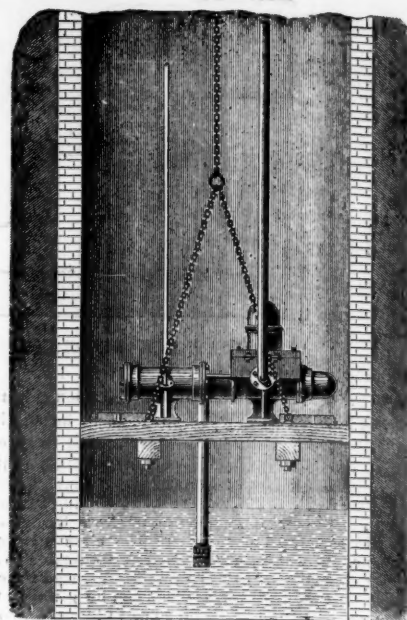
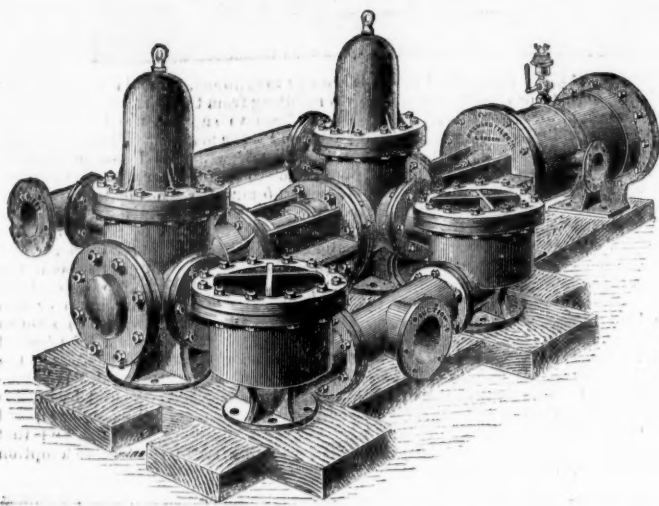
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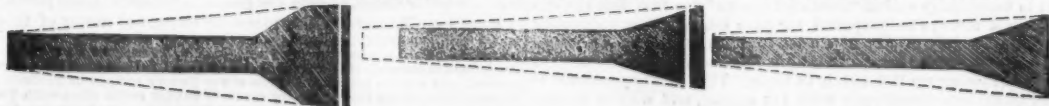
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# THE "LEVET" ROCK DRILL.

## SUPERIOR TO ALL OTHERS.



COPY OF TESTIMONIAL FROM THE ENGINEER, BLANZY MINES, FRANCE. Feb. 25, 1875.

I hereby certify that the new Rock Drill of C. Levet's System has worked at the Blanz Mines since Nov. 20 without there being the slightest necessity for repair. Its results up to this date have been superior to the other Rock Drills employed in the said mines.

(Signed)  
THE ENGINEER OF THE MINES, POUMAREAU.

THE SACCHARUM WORKS, SOUTHAMPTON.  
ANGLO-BAVARIAN BREWERY.

GENTLEMEN,—We have much pleasure in stating that the "STANDARD" Steam Pumps supplied to us for these works, and for our Brewery at Shepton Mallet, give us entire satisfaction. The two first we had from you have been in use for 12 months, and they are still in good working order. THEY ARE ENTIRELY FREE FROM THE NOISE IN WORKING WHICH ALL OTHER STEAM PUMPS WE HAVE TRIED ARE SUBJECT TO; they throw a large quantity of liquor fully equal to the amount named in your Circular, and we can confidently recommend them in preference to any other pumps we have used.

Yours truly,  
HILL, GARTON, AND CO.



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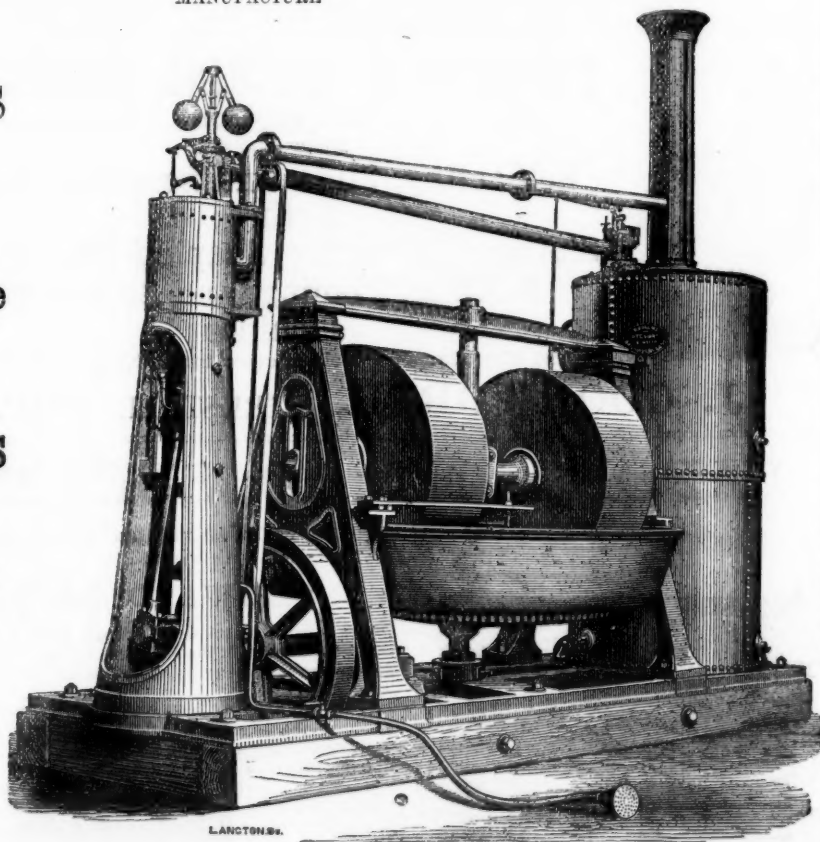
Every description of Leather, India-rubber, and Gutta-percha for Engineering and General Mechanical purposes.

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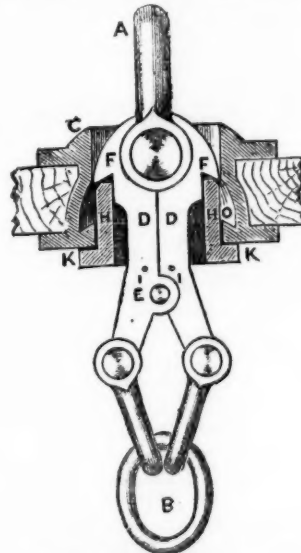
### ENGINEERS, BANBURY,

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PORTABLE  
Steam Engines  
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Winding,  
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## OVERWINDING IMPOSSIBLE. WALKER'S DETACHING HOOK, FOR COLLIERIES AND BLAST-FURNACE HOISTS.



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Walker's Hook, at Tockett's sinking, has saved six men's lives. On the 6th instant, the kibble was overwound, and but for the hook would have fallen down the pit, where six men were working, 120 ft. below, all of whom would probably have been killed. Thanks, however, to Mr. Walker's invention, the rope alone passed harmlessly over, the kibble remained suspended, and in half-an-hour everything was working as if nothing had occurred.—From the *Northern Echo* August 20, 1874.

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TO COLLIERY FURNISHERS, &c. &c.

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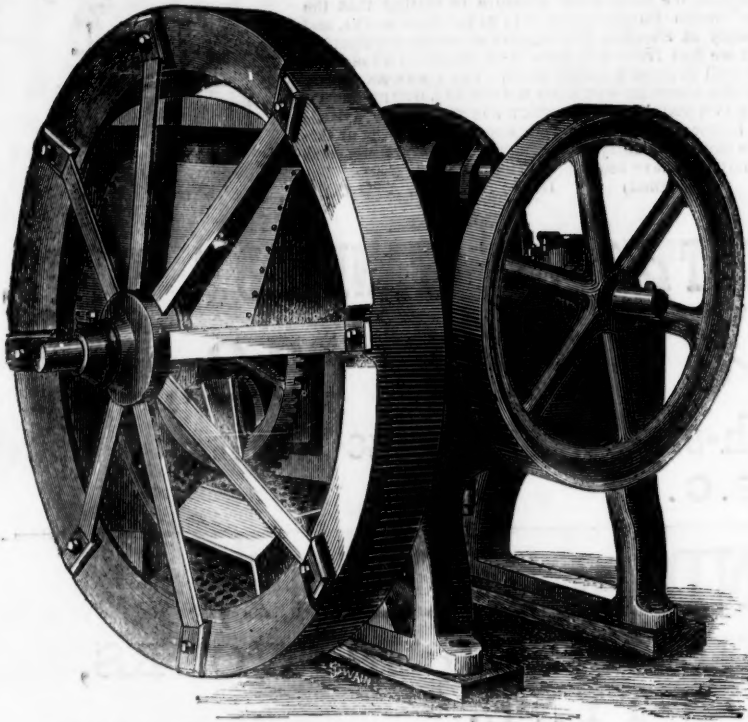
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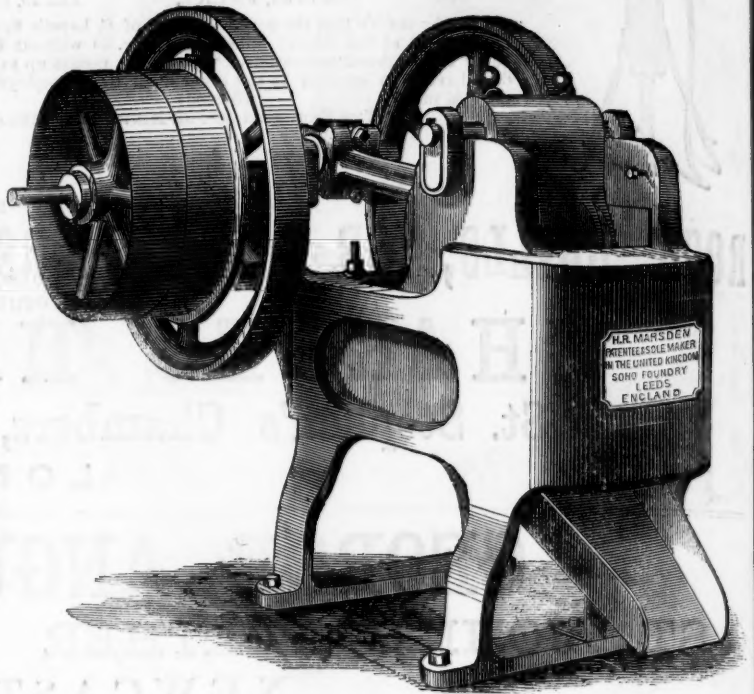
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**NEW RAFF-WHEEL MACHINE,**

WITH NEW PATENT CRUSHING JAWS,

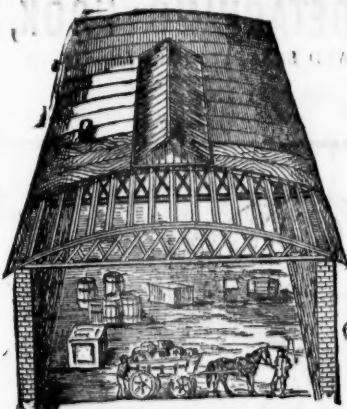
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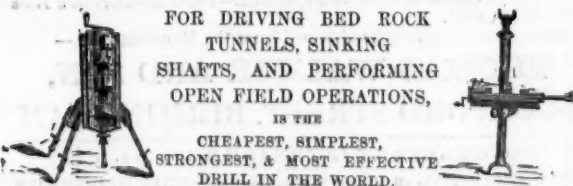
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